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THE LATE SIR GEORGE T. BROWN, C.B., M.R.C.V.S.

THE whole profession has read with regret of the death of the above gentleman, who was always, during his life, one of its most prominent members; for no one had greater standing, or commanded more respect in both veterinary and agricultural circles, during the past fifty years than Sir George Brown.

Born in 1827, he graduated a member of the Royal College of Veterinary Surgeons on May 15, 1847, and in 1850, when only 23 years of age, he was appointed as Professor of Veterinary Science in the Royal Agricultural College, Cirencester, a position which he held for very many years. He was afterwards appointed one of the Examiners of that Institution.

In 1865 he was appointed to the Board of Agriculture, working in conjunction with Professor Simmonds in the suppression of cattle-plague and other contagious diseases of animals; and in 1872, on the retirement of Professor Simmonds, Professor Brown was appointed as Chief Veterinary Adviser, a position which he held until 1896. Even after this date his services were continually in requisition as Consulting Veterinary Adviser. In 1880 he was appointed Principal of the Royal Veterinary College in Camden Town, and in 1893 was made a Governor. He took an energetic interest in all the work connected with teaching, his own part being particularly the subject of cattle pathology. He was appointed a member of numerous Royal Commissions and Committees. As a member of Council he took an active part in assisting the progress of the profession and was elected President in 1873 and 1874, acting as Vice-President for a period of eight years. He was at one time an Examiner to the Royal College of Veterinary Surgeons, and the Royal Agricultural Society of England elected him an Honorary Member. He did more than any other man to demonstrate to that Society the value of skilled veterinary advice and assistance, and no meeting at which the question

of animal welfare was discussed was ever considered complete without the presence of Professor Brown.

As veterinary editor to the *Field* his work was well known in sporting circles, and his contributions to the *Journal of the Royal Agricultural Society* were always practical and useful. He was the author of numerous brochures on popular subjects, and in 1862 was joint author of "Harley and Brown's Histology." He was made a Commander of the Bath in 1887, and received the honour of knighthood in 1898.

Few men have had a more successful career, and his death leaves a gap in our ranks which it will be very hard to fill.

Editorials.

ASEPSIS AND ANTISEPSIS IN VETERINARY SURGERY.

UNDER the above heading there is inserted on a further page of the JOURNAL an interesting translation from a French *confrère*, the writer being a veterinary officer in the French army.

It is worth reading, as it indicates in a very lucid manner the advances which have been made during the past few years in this branch of our professional work, notwithstanding the difficulties with which we have to contend when comparing our patients with those of our human *confrères*.

Every modern member of the profession knows that nowadays it is possible to do the larger proportion of the operations which he is called upon to perform either on horse, dog, or even the cow, with a reasonable prospect of obtaining primary union of the surgical wounds inflicted by the scalpel. How many of us, however, put into actual practice the principles of antiseptic surgery and surgical cleanliness? How many of us, for example, even carry in our surgical cases a razor for the removal of the hair before the incision through the skin is made? A few years ago one might almost have asked, how many of us even took the trouble to thoroughly apply the ordinary soap and water? And as to the disinfection of the instruments, even in the present day it is not too much to say that in regard to them the principles of antisepsis are often only carried out in a very perfunctory manner, for it is very certain that to merely lay them (probably after they have just come from the oilstone) in an unknown percentage of creolin or some other disinfectant and water for five minutes, or perhaps ten, just before they are required to be used, is mere fetish.

It is well known in our days that *absolute* cleanliness is the

desideratum which is always aimed at, and antiseptics are only used as a means to that end.

Our French colleague states that he has abandoned the use of antiseptics entirely, substituting in their place only the most scrupulous cleanliness. It is perfectly true that if soap and water are used with sufficient thoroughness, especially if combined with some such substance as ether or ethereal soap to remove sebaceous material from the hair follicles in the skin, and the instruments are sterilised by boiling, antiseptics may, except in special cases, be dispensed with. And certainly the use of these drugs in too strong a form is to be deprecated.

If, however, they are only used with discretion, there can be no question but that they are an absolute, essential, and valuable aid to all operations, particularly when the lower animals (whose skins are always in a more or less surgically dirty condition) are concerned. For the instruments there is nothing simpler or more readily accessible than a clean saucepan or some such vessel in which they can be boiled; for the operator's hands, to *thoroughly* soak and scrub with soap and hot water containing some reliable disinfectant, to again scrub with ethereal soap or some such preparation which will remove grease, and finally to rinse in a clean solution of warm antiseptic; and for the patient, to shave off the hair and then treat the skin as mentioned above for the operator's hands is quite sufficient; whilst finally, the wound itself must be hermetically sealed by iodoform-colloid or some such substance which will keep it from contact with the external surroundings. If the above simple directions are carefully followed, in by the far larger proportion of surgical cases a primary union is certain to result, and the sequel to the operator, his client, and the comfort of the patient is a source of endless satisfaction. Such words as "laudable pus" are incomprehensible nowadays, and should never be associated with surgical wounds.

Given a *clean* skin, *clean* instruments, a *clean* operator, and an hermetically sealed wound afterwards, and there can only be one result, viz., primary union of the several surfaces. Dirty surgery, even where the domesticated animals are concerned, is inexcusable in the present state of antiseptic knowledge.

A WORD MORE UPON OUR CLAIMS AS MEAT INSPECTORS.

THE present time is an especially good one in which to urge the claims of our profession as being the one whose members are best fitted by their training and expert knowledge to look after the meat supply of the nation.

As stated by Mr. Lloyd, the Veterinary Inspector of the City of Sheffield, in an article in this month's number of the JOURNAL,

"veterinary surgeons are the *only* class of professional men who, by their practical training and experience with animals, are properly qualified for the work." In this opinion he is also quoting what has already been stated by the authorities who have dealt with this subject in the cities of London and Glasgow, and all the speakers at the Section of the recent Sanitary Congress which touched upon this point, most of them medical or sanitary specialists, were unanimous upon this. A few years ago it might have been argued that the profession was not ready to take its proper sphere in this direction, but that cannot be brought forward as an argument in the present day.

Other countries have long ago awakened to the fact that their health is best safeguarded by efficient inspection, and their first thought is always that, at all events their chief inspector, and usually each of the subordinates, shall be a qualified veterinary surgeon, and many of them go so far as to keep veterinary surgeons stationed in this country to examine cattle before they are exported.

What is required is the establishment of a veterinary public health service based on similar lines to that of the medical sanitary service of the present day.

The cleanliness of our milk supply would be ensured, the filthy conditions under which some of our dairying industry is carried out would be impossible, and, of necessity, the health of both man and beast would improve. In all large towns the necessity for competent meat inspection is clearly shown by the amount of meat which is confiscated every year at all towns where there is a public abattoir and an efficient system of meat inspection. It is a pity that these places are, comparatively speaking, so few in number.

If only pressure could be brought to bear upon the proper authorities, and sufficient salary offered to induce members of the profession to devote their lives to this branch of the department of public health, there need be no fear but that a sufficient number of thoroughly competent and well-trained men would come forward to fill up the positions.

"CURRENT MEAT INSPECTION."

BY J. S. LLOYD, F.R.C.V.S., D.V.S.M., VICT.
VETERINARY INSPECTOR TO THE BOROUGH OF SHEFFIELD.

THE recent exposures regarding the inspection of meat at the Chicago stockyards compel consideration of the subject in relation to the meat supply of the United Kingdom, and whereas panic legislation is to be deprecated, it is well that the matter should be carefully considered whilst the disclosures are fresh in the minds of the public. That this is being done is evidenced by the way in which the matter is being discussed in both lay and professional papers, and by the accounts of discussions which are daily taking place at meetings of local and other sanitary authorities. Whether permanent benefit will result depends upon the action taken after these discussions, and it is with the intention of pointing out some directions in which the writer thinks action might be taken that these lines are written.

Any remarks dealing with the inspection of meat intended for consumption in the United Kingdom naturally falls under two heads, namely, those connected with the meat of home-killed animals and those connected with meat imported from abroad. What amount of meat actually comes under either of those heads is difficult to estimate. There is, however, no doubt but that the greater proportion of the foodstuffs consumed in this country comes from abroad, and possibly the same remark would hold good as regards our meat supply. According to the report of the Superintendent of the London Central Markets for the half-year ending June 30, 1906, the quantity of meat, poultry, &c., passing through the markets weighed over 215,000 tons. Of this total the products of the United Kingdom represented only 21 per cent., whilst 79 per cent. came from other countries.

"*Home-killed*" *Meat.*—The total numbers of cattle imported into this country during 1905 were, according to the recently issued Board of Agriculture Returns, as follows:—

	Cattle	Calves	Sheep	Pigs
Ireland	686,815	62,316	700,626	363,823
Channel Islands ...	1,515	...	...	...
Iceland	...	...	4,749	...
Canada	148,718	...	28,240	150
U.S.A.	414,906	...	150,095	...

With the exception of a few "stores" from Ireland and the Channel Islands kept for breeding purposes, all these were intended for slaughter, and those from the American Continent slaughter at the ports of landing within ten days. The total numbers of cattle, sheep and swine in great Britain, June, 1905, are given in the Agricultural Returns as follows:—

Cattle	Other Cattle		
Cows and heifers in milk	Two years old and above	One year old and under two	Under one year old
2,707,392	1,415,317	1,471,070	1,393,241

Sheep		Swine
One year old and above	Under one year old	
15,083,283	10,173,913	2,424,919

It is probable that the majority of cows in milk do not live more

than five years, but are then killed by the butcher, consequently about one-fifth of their number, 500,000 (*sic*), have to be replaced yearly, thus requiring that number to step up consecutively from the figures of the younger cattle.

There will be thus left in Great Britain the following for slaughtering purposes: 500,000 cows, 900,000 other cattle two years old or over, and 50,000 one year old and under two years, with about 1,300,000 calves.

To produce 10,000,000 lambs per year will require at least 7,000,000 ewes and 140,000 rams, but as possibly one-third of each year's lambs are slaughtered every year before June, these figures must be increased by at least one-half, giving 10,000,000 ewes and 200,000 rams as an approximate number of permanent breeding sheep, leaving 5,000,000 sheep one year old and above, and 10,000,000 sheep under one year old for slaughtering purposes.

Pigs are, of course, known to be prolific breeders, so that by estimating the number killed per year as four or five times the number kept at any one time, there is probably some 10,000,000 or so pigs killed for edible purposes every year.

The writer does not wish it to be understood that there is any attempt at accuracy connected with the above estimates, the figures only being introduced to emphasise the fact that a very large number of animals, home and foreign, are killed every year to produce "home-killed" meat.

Foreign Meat.—This may briefly be described as coming under four heads: Frozen meat in bulk, fresh meat cooled or refrigerated, tinned or canned meat, and box or boneless meat. What quantities of either come into this country the writer has no figures to show, but that it is a very large and increasing amount there is no doubt. To take one exporting country as an example will prove this:—

Argentina—Cattle and sheep exported to Great Britain:—

	Cattle	Sheep
1897	73,852 ...	345,217
1898	89,369 ...	430,073
1899	85,365 ...	382,080
1900 (three months only)	38,562 ...	178,969

From April 2, 1900, to February 3, 1903, importation from Argentina was prohibited. During the three months, February 3 to May 8, 1903, 27,817 cattle and 82,941 sheep were exported to Great Britain, when the live cattle trade was again prohibited. At the present time, no doubt, a corresponding trade is done with this country in the frozen meat line; large quantities of River Plate mutton and Argentine beef being imported here.

The following figures show the respective sources of supplies at the London Central Market for six months ending June 30, 1906:—

United Kingdom	46,494 tons.
Australasian	53,719 ,,
North and South American	93,618 ,,
Continental	21,520 ,,
Total	215,351 ,,

The number of carcases exposed for sale in 1904 in the Dead Meat

Markets, Water Street, Manchester, are given as follows in the Report of the Medical Officer of Health, 1904:—

		Beasts	Sheep	Lambs	Calves	Pigs
Abattoir killed		24,551	100,049	49,365	409	2,982
Imported	Fresh	38,463	54,256	271	15,668	21,223
	Chilled and frozen ...	14,664	185,757	39,244	565	25,036

Such figures convey an approximate idea as to the sources of the meat supplies of our large towns, as no doubt similar returns from other towns would give similar results.

Meat Inspection at Home.—Under the present law meat inspection is carried out by local sanitary authorities, acting through their Medical Officers of Health and Sanitary Inspectors, under powers given by the Public Health Act, 1875, and the Public Health Acts Amendment Act, 1890. In Scotland the Public Health (Scotland) Act, 1897, gives corresponding powers to local authorities, and is remarkable for the fact that veterinary surgeons, appointed for the purpose, receive legal recognition as inspectors of meat.

The qualifications of meat inspectors has been a matter of contention for some years. According to the Report of the Royal Commission on Tuberculosis, issued in 1898, "chaos" is the only word to express the absence of system in the inspection of meat, and strong remarks are made as to the want of uniformity in the methods of inspection. Thanks to a few large towns, employing veterinary surgeons as inspectors of meat, and due to the Royal Sanitary Institute issuing meat inspection certificates to some 190 odd sanitary inspectors, who have passed the necessary examination, matters are not now in quite such a bad way as in 1898. Still, when compared to the splendid systems of meat inspection, coupled with the assistance of public abattoirs, on the Continent, it cannot be said that the safeguard of efficient meat inspection in this country is such as is requisite to ensure the public receiving nothing but wholesome meat derived from healthy animals.

Many meat purveyors will no doubt state that their trade is "inspected to death," but whilst the writer is quite willing to allow that the better class of butchers court inspection, and wish to possess, expose, and sell only the best meat—meat in all respects fit for the food of man—he also knows there are other butchers who are not as careful as they ought to be in respect of the animals they buy and the meat they sell. To put it shortly, the writer is of the opinion that meat inspection in the United Kingdom is unsatisfactory at present, for the following reasons: (1) A scarcity of properly qualified meat inspectors; (2) a want of knowledge of many present meat inspectors; (3) the facilities for indiscriminate slaughtering of animals for human food on unlicensed premises; (4) The presence of private slaughter-houses in places, particularly country districts, where adequate inspection is at present impossible. That diseased animals are killed and dressed at farms in country slaughter-houses, and even in town slaughter-houses, situate in back streets and out-of-the-way places, is common knowledge to all who have any experience of meat inspection or the meat trade. One fact in figures will show the significance of this statement. In Manchester, in the year 1904, out of 234,609 lbs. of meat condemned by the inspectors at the abattoirs and carcase market, no less than 179,164 lbs. were dressed meat consigned from places out-

side the city. It is within the present knowledge of the writer that the majority of the meat condemned in Sheffield is meat consigned there by outside farmers and butchers, carcases of animals suffering from such diseases as anthrax and black quarter being thus sent in only recently.

Another drawback to efficient meat inspection is the inadequacy of the law to always deal with such cases as the latter, because, according to Justice Kennedy, an article of food is only liable to seizure if (1) it was intended for the food of man; (2) if exposed for sale; and (3) if unfit, in the opinion of the inspector; whilst under the anthrax order it appears that a prosecution can only be undertaken by the local authority of the district where the outbreak of disease occurs, and who may not be the local authority who receives the carcase and exposes the disease.

Inspection of Foreign Meat.—Previous to January, 1905, when the *Lancet* published some articles on meat inspection in America, foreign meat inspection almost without exception was considered to be far in advance of similar work in this country. Following upon the exposures in the *Lancet*, Mr. Upton Sinclair contributed his celebrated article to *Everybody's Magazine*, and wrote his famous book, "The Jungle," since when the Neill-Reynolds Report has been published, and as a consequence the American Senate has passed the Meat Inspection Bill, the cost of inspection under which is estimated to be £600,000 a year.

That there was need for such inspection was conclusively proved by the exposures made; in fact, nearly a year ago the Chicago authorities commenced to put their house in order by appointing the present Commissioner of Health, Dr. Chas. I. Whalen, M.D., with the result that 3,487,000 lbs. of food were condemned in the last five months of the year, or 85·5 per cent. of the total—3,935,000 lbs.—destroyed during the whole year. Considering that such a large proportion of the meat consumed in the United Kingdom comes from abroad, it naturally follows that foreign meat inspection is an important matter to the British public, and especially is this the case with respect to "canned" and "boneless" meat.

According to a reply given in the House of Commons lately by Mr. Lloyd-George, "the American trade returns show that canned meat, fish, and fruit exported to the United Kingdom in 1900-1 was £2,234,000, and in 1904-5, £2,062,000." It will consequently be seen that canned food plays an important part in the food supply of this country, and although putrefactive changes taking place in the cans after they are closed can be detected by their "blown" condition, it is practically impossible to detect any diseased conditions which may have been present previous to the "canning" process, a remark which applies equally to "boneless" meat.

In respect to the latter, it almost appears that the only safeguard the public could have at present would be its entire prohibition, at any rate pending some adequate inspection by British inspectors to be provided in the future. Not only are local authorities demanding this, but many of the meat traders themselves feel uneasy about it, attributing as they do the present bad trade, particularly in sausage-making, to be due to the public distrust of anything in which imported meat may be an ingredient.

It must not be supposed that all foreign meat imported into this country is subject to the farce of inspection exposed in Chicago.

In Victoria, Australia, the Government undertakes to freeze, handle, provide wraps, place on board ship, prepare, and deliver bills of lading for a small charge per carcase, and in addition an inspector of exported products will grade, weigh, and tag each carcase.

In New Zealand, as is well known, a splendid system of veterinary meat inspection is in force.

In Denmark, by virtue of a set of instructions issued on August 15, 1903, it is the duty of the veterinary inspectors authorised to inspect meat for export to retain from export the carcase of any ox or pig in which the smallest deposit of tubercle is found, or from which any part of the pleura or peritoneum has been removed.

In Hamburg each animal has to pass examination by a veterinary surgeon, a second examination being made after the animal has been slaughtered and before the internal organs have been removed, and yet a third examination when the carcase has been dressed and is ready for sale, any diseased carcase or part being immediately seized by the inspector. After examination the meat is graded and stamped according to quality, three grades being recognised. Pending legislation of a compulsory character the Dutch Government have introduced a system of voluntary inspection and marking by Government officials, at a very small charge, of all meat intended for export. This system has been adopted to meet the requirements of the English market, and it is stated with considerable success. It should be added that all the inspectors are veterinary surgeons.

Improvements Required in Meat Inspection.—As stated early in this article, there is evidence to show that advanced local authorities are alive to the necessity of improved methods of meat inspection, and particularly is this the case in connection with the cities of London and Glasgow. What appears to be desired is some arrangement whereby the public may be assured that the meat they buy has been subjected to systematic and uniform inspection of a high standard by properly qualified meat inspectors. As to the qualifications of the latter, it is gratifying to know that both of the towns above mentioned lay stress upon the necessity of employing veterinary surgeons for the work, the *only* class of professional men who by their practical training and experience with animals are properly qualified for the purpose.

To ensure that all meat has been properly inspected, several alterations in the existing law and procedure will be required.

(1) *Inspection must be made compulsory*, and to facilitate this, it will be necessary for all animals to be slaughtered either in public abattoirs under the direct supervision of the meat inspector, or in licensed slaughter-houses, from whence the carcase and offal must not be removed until inspected, passed, and marked. Indiscriminate slaughtering at farms and at other unlicensed premises must be prohibited, except in cases of accident or for home consumption, such slaughtering to be notified to the meat inspector, so that the meat can be examined before removal. Emergency slaughtering of sick animals should not be allowed until after examination by a veterinary surgeon, and his granting a certificate that there is reasonable probability that

the carcase will be fit for human food, and that there is no danger to the slaughterman as there is, for example, in case of anthrax. Heavy penalties to follow misdemeanour.

(2) *Improved Legal Measures.*—Simple possession of diseased meat should be sufficient to warrant conviction of the possessor, unless he could prove that the meat was not intended for the food of man. Both the London and Scottish Public Health Acts are great improvements upon the Public Health Act, 1875, in this respect. The fact that diseased meat was dressed as for human food should imply that it was so intended, and there should be no necessity to prove exposure for sale to obtain a conviction.

(3) *Provision of Public Abattoirs and Gradual Abolition of Private Slaughter-houses.*—In Glasgow, and also in one or two Lancashire towns, private slaughter-houses have been abolished; in these and many other towns public abattoirs have been erected. That both facilitate the better inspection of meat is undeniable, but both are costly to the ratepayers and more or less objectionable to the butchers. If public abattoirs are built, the writer is of opinion that they should be small in size and large in number, so as to be easily accessible to the butchers. Each should be in proximity to a railway siding, and under the charge of a qualified meat inspector. Whether private slaughter-houses should be altogether abolished is a matter also of opinion. Annual licensing should certainly be required, strict sanitary arrangements demanded, and traffic in diseased animals or meat should confiscate the licence. Strict enforcement of these measures, with a better staff of inspectors, would probably tend to prevent the use of such places for objectionable practices, and at the same time keep down the rates and be an advantage to honourable butchers who wished to use them. Private slaughter-houses in very thickly populated and out-of-the-way places should certainly be abolished.

(4) *Systematic and Uniform Inspection by Properly Qualified Meat Inspectors.*—In practically every country practising meat inspection, except the United Kingdom, all the chief meat inspectors are veterinary surgeons; and to secure the above inspection, which both the public and the trade are demanding, it will be absolutely necessary to establish a proper system of veterinary meat inspection here. Owing to all British veterinary surgeons having to pass a similar examination in meat inspection, such a system will be the greatest guarantee of uniform inspection. Owing to their practical training in animal diseases, in chemistry, anatomy, histology, pathology, and bacteriology, there is no doubt but that veterinary surgeons are an easy first as fit and proper persons for meat inspectors—a guarantee that veterinary meat inspection, whilst being of a high standard, is also practical and reasonable.

The establishment of a proper system of veterinary meat inspectors, in the opinion of the writer, is a matter for Government execution. To ensure general inspection a large staff of inspectors is required, the men appointed to do the work should receive adequate salaries and be free from private practice. Superintending inspectors should be appointed for counties and large cities, the branch officers being also concerned with the veterinary inspection of dairies, and under the Contagious Diseases (Animals) Acts, being in fact veterinary officers of (animal) health working in conjunction with medical officers of (human) health.

(5) *British Inspection of Foreign Dead Meat.*—An important branch of meat inspection, as affecting the inhabitants of the United Kingdom, remains to be dealt with. Foreign animals killed in this country should, of course, be subject to the same inspection as home-bred animals. Foreign meat in bulk, whether frozen or refrigerated, can also be subjected to some kind of inspection in this country, but owing to the absence of the viscera such inspection is not altogether satisfactory. Inspection of "canned" and "boneless" meat is so unsatisfactory—practically so impossible—that its prohibition is being made a question of practical politics, the only safeguard being "protection." Several foreign governments now keep veterinary surgeons stationed in this country to examine cattle exported from here, with the intention of protecting their herds at home from disease. If such a procedure is necessary to protect cattle in those countries from disease, surely it is equally important to protect human beings in this country from disease, and, in the opinion of the writer, this can best be done by employing British veterinary health officers to examine all animals and food products intended for export to this country, in all countries wishing to carry on such export trade.*

Such a service in foreign lands would ensure for obvious reasons a far better guarantee of systematic uniform inspection of meat exported to this country than is possible after arrival here. For instance, the animals would be examined alive, the carcases and offals examined after slaughter, all passed could be properly stamped with the Government stamp, canned and even boneless meat, if procured from previously examined healthy animals, would receive official guarantee of freedom from disease, and, except for putrefactive changes, would be accepted in this country without reserve. By recruiting the staff of such veterinary inspectors for foreign service from the ranks of a properly equipped service of British Veterinary Officers of Health, a permanent supply of reliable men would always be available, and satisfactory meat inspection would be obtained both at home and abroad.

INVESTIGATION OF STOCKYARD CONDITIONS.†

BY JOSEPH HUGHES, M.R.C.V.S., PRINCIPAL OF THE VETERINARY COLLEGES, CHICAGO, ILL.

FOR more than twenty years it has been my privilege, at intervals, to visit the various packing houses in this city, sometimes through mere curiosity, sometimes while showing visiting friends around, and again, and most frequently, for observing the inspection of animals prior to and after slaughter. My visits on such occasions commonly resulted in a tour of the entire plant or plants visited, giving me opportunities to make observations on conditions generally and of the closest possible range. My occupation and professional duties have in the past brought

* By imposing a levy of a few pence upon all carcases, &c., examined and stamped, as now paid by Danish and Dutch exporters, it is probable that a considerable sum towards paying the salaries of such foreign inspectors would be procured and practically the whole foreign service could be made self-supporting.

† Reprinted from the *Chicago Veterinary College Quarterly Bulletin.*

me in contact with many shambles—some decidedly primitive in character, while others, such as those at Birkenhead, Glasgow and Dublin, enjoyed the distinction of being the most extensive and up-to-date in their respective countries.

The extraordinary and unfortunate agitation that has arisen and reached fever heat during the past month regarding conditions at the Union Stockyards in this city, affecting as it does a profession in which I am vitally interested, has caused me to again make a number of visits to the packing houses, so that with my own eyes I might see and determine the truth or falsity of the reports so wildly agitating the press and public mind.

In my visits to the stockyards and packing houses in the past I had never observed the horrible unsanitary conditions and disgusting practices described in the Neill-Reynolds report sent to Congress by the President, so it must be admitted that my investigation was started with a distinct disbelief in the report alluded to. This disbelief partially resulted from a knowledge that the investigation and report by Messrs. Neill and Reynolds had, or pretended to have, their inception and foundation in a fictional work of comparatively recent issue—"The Jungle"—consequently it seemed to me that the basis of the report being spurious and unstable, its body must necessarily be so. Besides, I was aware that in order to investigate the packing houses the President had, earlier in the season, appointed a committee of four members, three being veterinarians of probity, connected with the Bureau of Animal Industry—Dr. J. R. Mohler, Dr. R. P. Steddom, and Dr. U. G. Houck, and the fourth the General Solicitor for the Department of Agriculture, Mr. G. C. McCabe. These formed a representative body, it must be admitted, that was thoroughly capable of dealing with the problem to which it was assigned. For some unknown, or at least unexplained, reason this committee's report was withheld. Instead, a second committee, composed of two laymen, Messrs. Neill and Reynolds, was employed by the President to make another examination of the packing houses and report. This it did after some time. It is the report of this committee, stuffed with venomous generalities and evidently worded and constructed so as to appeal to the baser instincts and prejudices of the masses, that first reached Congress. Before it did so portions of its contents leaked out. Threats from Washington for several days preceded its publicity, and these were adroitly circulated with the apparent object of inflaming public opinion against the packing interests, so that when the report did finally appear its full text, with all its misleading details, was extensively published, and naturally caused widespread consternation.

Some days later, when the public had partially digested the Neill-Reynolds production, but had not as yet recovered from its nausea, the sane, accurate and exhaustive report of the Veterinarians of the Bureau of Animal Industry was sent to Congress, but did little to modify the harm already done. This latter report dealt with facts rather than generalities, and treated exhaustively of the conditions in the various packing houses. Only a few excerpts from the report found their way into the public press, and even these seemed to be selected so as to have a tendency to bolster up the Neill-Reynolds communication.

Why should the report, emanating from the officials of the Bureau of Animal Industry—the first report made—have been shelved and not promptly submitted to Congress when the agitation commenced? The men who made it had then the confidence of the Government, and they are still in the Government service. They are highly respected men, versed in sanitation and meat inspection, and from long experience are accustomed to conditions incidental to slaughtering of animals and packing of meats. These qualifications impeded rather than aided them, for in this instance they evidently did not contribute the material sought for. It remained for Messrs. Neill and Reynolds to supply it. What prior experience these latter gentleman have had in connection with slaughter-houses or meat inspection does not appear, except that in the body of their report, Section 3, under the caption "A Model Slaughter-house in Contrast with those of Chicago," mention is made of a visit of one of their number to a model establishment in New York. This is apparently injected into the report so as to establish their familiarity with packing house floors. Both, however, are well-known professional sociologists, and their selection for this important mission appears to have a peculiar significance. Persons possessed of fine sensibilities, emotional temperaments and delicate olfactory organs have no business on the killing or gut-cleaning floors of any packing house, no matter how perfect its hygienic construction may be.

The taking of life and spilling of blood is abhorrent to mankind in general. Still, humanity demands it, but if compelled to witness the scene pronounces it revolting. In the average person, more especially in those of a pusillanimous nature, it engenders a disgust which clings tenaciously and frequently influences his better judgment. Disgust, however, which under these circumstances develops in the imagination of the spectator or investigator without a definite objective foundation, should not be countenanced in any way whatever. That such disgust took possession of Messrs. Neill and Reynolds is only too evident, as it appears to permeate their report throughout. It was considerations such as these that led me to utterly discredit their report, for the conviction forced itself upon me that if these two gentlemen were installed in the kitchen of any pretentious hotel or mansion in Washington for a period of two and a half weeks, and had the inclination to accurately record offensive incidents in connection with the preparation of the various culinary messes as well as the movements and ablutions of the servants, their report, if sent to Congress, and published broadcast would rival in sensationalism the one they have already made.

It is recorded somewhere that Zoillus once presented Apollo a very caustic criticism upon a very admirable book, whereupon the god asked him for the beauties of the work. He replied that he only busied himself about the errors. On hearing this, Apollo, handing him a sack of unwinnowed wheat, bade him pick out all the chaff for his reward.

The Union stockyards are not a park, and the packing house floors are not drawing-rooms. They were not constructed with that aim in view. In visiting them for purposes of observation and criticism one must divest himself of his fine sense, his exalted sense, as these are not half as useful to him as his common-sense. Having

accomplished this he has attained a state in which he is capable of making an impartial criticism, and besides, an experience with animals and their environments is all essential.

For four days, covering three separate weeks, commencing immediately after Messrs. Neill and Reynolds concluded their investigation, I have been to the stockyards and thoroughly gone over the four large packing establishments against which the principal attacks were concentrated. Before doing so my attention was directed to the condition of the streets, alleys, pens, sheds and platforms within the confines of the yards. The streets and alleys are well paved with brick and maintained in a remarkably clean condition, considering the amount and character of the traffic they sustain, and present a striking contrast to six or eight years ago when wood pavement chiefly obtained.

The great maze of cattle pens seen on all sides on entering is paved, and as clean as the purposes for which they are used will permit. These pens are unroofed, in deference, it is said, to the wishes of the stockmen and for hygienic reasons. The sheep pens are all roofed, and the hog pens partially so. They are paved, clean, comfortable and sanitary. Taken all in all those portions of the yards alluded to present evidences of extensive and well-directed improvements; convenience and comfort of animals and general cleanliness being the apparent consideration.

In the packing honses I was given every facility for investigation and had free access to every conceivable room from roof to cellar. I accepted the services of guides in the various places so as to expedite my passage, but was in no wise influenced by information offered by them. I came to see, hear, feel, smell and taste, and go where my inclination directed. My plan was:—

(1) To observe conditions pertaining to the handling of meat from the moment of slaughter of the animal, following it through its various stages until it finally became a market product for human consumption.

(2) To study the methods of Government inspectors in detecting diseased conditions, and the disposition of condemned carcases or portions of same.

(3) To note generally the sanitary state of the packing houses.

A volume of considerable size might be produced on the subjects embraced in these three paragraphs, and were it conscientiously written, after a most scrupulous and searching enquiry into the details of meat packing, the great preponderance of evidence would be in favour of the cleanliness and wholesomeness of the finished product. I have followed the carcases and divisions of same, of the various animals slaughtered, from the killing floors to the cooling rooms, to the cutting rooms, to the smoke rooms, to the pickle cellars, to the sausage rooms, to the cooking rooms, to the canning rooms, and in no instance in any of the packing plants have I seen the meat submitted to any process that would in my opinion make it injurious or deleterious to public health, or even obnoxious to the eye. On the contrary, an endeavour was made in the handling of meat to observe cleanliness to a marked degree.

In restricted space it is not possible to go into specific details of the manipulation of meat. It may be said, however, that the fresh, the pickled, the smoked and dried meats, which comprise 93 per cent.

of the carcase and which are ordinarily met with in the public vending markets, are handled with as great care and regard for cleanliness at the packing houses as they are before the eyes of the purchasers and consumers in a first-class butcher's shop. So far as cursory examination went, the pickle used appears to be the old-fashioned common salt, saltpetre, sugar and water mixture, and use of anything else was denied.

In the cooking and canning rooms, I closely inspected the meat and other materials before being placed in the cauldrons, also after cooking, and during the canning and sterilisation processes. The meat used was cleanly handled, and chiefly of a lean character, the packers recognising that lean meat, even that coming from animals that are lean but healthy at time of slaughter, has equal nutritive value, and makes a more attractive and edible canned product than if the animals were extremely fat.

The canning is done either by hand or by machinery, and the sterilisation of canned meats is effected entirely by heat. I saw no preservatives, chemicals, or colouring matter used in these departments, and questions put with the object of ascertaining as to whether they are in use in the establishments visited elicited the most vigorous denials; except that in such goods as corned beef the ordinary pickle is used. As proof that no preservatives are used in such packages as canned roast beef or veal loaf, it was maintained that if a can were opened and exposed its contents would decompose as quickly as would a piece of fresh beef subjected to exposure.

Summing up, it is my candid opinion, from observations I have made, that notwithstanding the immense scale on which this canning industry is carried, the product is as clean and healthful as that prepared in the average kitchen of this or any other country.

At the stockyards in the United States the meat inspection service is represented by veterinarians who are graduates of recognised veterinary colleges having a three years' course, and who are, in addition, required to pass a technical civil service examination before being admitted to the service. The inspectors are consequently educated professional men, capable of recognising diseased conditions of animals and determining the wholesomeness and edibility of meats. Their work in the various sections of the packing houses, notwithstanding its disagreeable character, is performed with a degree of faithfulness that is truly admirable. Even with their previous education and eligibility for the position, under the regulations of the Bureau of Animal Industry they are never entrusted with making a final decision, or passing the carcases of animals showing the slightest evidence of disease or taint until they have fully demonstrated their competency. During the intervening time the opportunities afforded enable them to detect at a glance pathological lesions affecting the viscera or carcase of an animal undergoing slaughter, that would render the meat product unfit for food. The knowledge they show in this respect, as well as the rapid work they perform, is simply remarkable, and in the houses investigated by me no animal, or portion of an animal, escapes their rigid scrutiny. When in the judgment of the inspector a given carcase or portion of a carcase is diseased or otherwise unfit for food, it is tagged and recorded, then put away for subsequent and more thorough examination by a second

inspector, who either releases or condemns it. Lesions that, in the light of modern pathology, are comparatively innocuous, are considered sufficient justification for sending carcases to the offal tanks. Owing to the great plenitude of meat in this country the Bureau of Animal Industry has always considered that if error is made it is best to err on the safe side, and has, as a result, drawn arbitrary rules for the guidance of its inspectors. As a consequence portions of and entire carcases that in other countries would be regarded as healthful, edible meat are consigned to the tanks. For the reason given there is absolutely no danger of infected meat, or, in fact, meat diseased in any form, reaching the public from establishments where Government inspection is maintained. When condemned the carcases are mutilated and taken to and placed in rendering tanks, which are sealed, and steam turned on in the presence of the inspector, who returns after four hours and breaks the seals. In the meantime a temperature of at least 220° F. has been maintained in the tanks.

It should be a matter of great satisfaction to the Bureau of Animal Industry that is responsible for the acts of its inspectors and to the public, which is interested in the wholesomeness of food, to know that in all this trouble, real or imaginary, the United States veterinary inspectors have not been discredited. True, certain pseudo-pathologists, ignoring the work of authorities on meat inspection recognised the world over, and finding it easier to be critical than correct, have addressed sensational articles to the local press, reflecting on the efficiency of the service and the integrity of the United States inspectors. For the enlightenment of these would-be critics it would be a charitable act if some kindly disposed inspector would dispense a little—even a very little—of the knowledge he possesses on the differentiation of ordinary pathological lesions found during the slaughter of food-producing animals, and incidentally on the question as to what meat is fit and what is unfit for human food.

The average large packing house, considered sanitarily, presents, if examined early in the morning before work has commenced, a different aspect from that which it exhibits towards the close of the day. Gangs of night workmen, armed with fire hose, pour streams of hot water on floors and benches and trucks that have already been sprinkled with soda, and then thoroughly scrubbed. On completing their work the places are clean and free from odour, and it is only by such constant cleansing that the houses can be maintained in a tolerable condition. Later, when the employees arrive and work has commenced the same free use of water is continued, more especially on the killing and casing floors. The result is that the air is saturated with a steamy moisture, partly evaporating from the floor and partly exhaled from the carcases or entrails. This moist atmosphere is noticeable throughout the houses, and is occasioned apparently by the scrubbing to which they are constantly being subjected, and partly to the fact that the majority of departments have to be maintained at a comparatively low temperature, which does not favour drying.

Notwithstanding these conditions the employees, both men and women, are a healthy, cheerful and apparently contented people, the majority showing marvellous dexterity in the various positions which they fill. The women employees are exceedingly clean and neat in appearance, and the same might be said of employees generally

outside of the killing, cutting and casing floors, where the very nature of the work they perform makes strict cleanliness an impossibility. At the risk of being considered impracticable, I would suggest that these men be provided or compelled to provide themselves with a white cap, white rubber apron, sleeveless shirt and black rubber boots, or other similar outfits of a hygienic character. While making recommendations, my opinion also is that all water-closets should be in isolated buildings, separated completely from the packing houses proper, and have in conjunction abundant cleansing facilities, not only for the person but also for the working outfit, which must of necessity daily become blood-stained or greasy as a consequence of the occupation of the workmen. It was pleasing to note the many floors constructed of well-laid vitrified brick, as well as asphalt and cement. Impervious, well-drained floors should at as early a date as possible supplant those of wooden construction in those departments where much moisture exists. Men will expectorate, consequently cuspidors containing an antiseptic should be liberally provided on all floors. Whitewash or calcimine might be used more liberally in some sections of the buildings, and the windows regularly cleaned so as to admit all the light possible.

It is, however, easier to criticise than correct. That the sanitary condition of the packing houses might be improved their owners admit. Their houses are not perfect in this respect; still, should they decide to raze and reconstruct them, at an unlimited outlay and on the most approved hygienic principles, they would still be insanitary. Perfect sanitation is a chimerical proposition, and only exists in the minds of those who have made no efforts to inform themselves on the practical affairs of life as they exist. It is a worthy proposition, but impossible of attainment, more especially in the immense establishments under consideration, where swarms of brute life are daily being received, killed and dressed by an army of human operators, who during this process are asked to maintain rigorous personal cleanliness, and at the same time get rid, in a strictly sanitary manner, of the abundance of filth and objectionable offal that naturally belongs to each animal. The practical hygienist promptly recognises the difficulties surrounding this proposition, while with the visionary æsthetic it is a matter of easy accomplishment.

It may be many years before the country retrieves its standing and losses as a consequence of the gross misrepresentations made regarding its packing industries. In the report that reached Congress, in the columns of the public press, and in the communications regularly sent to foreign countries, truth has been perverted and obscured, and falsehood boldly paraded in the foreground until the public, dismayed and sickened, had almost decided to abandon the use of meats in any form. Now that a condition of sanity has succeeded the delirium that seemed to possess the people for two months past and that pique has been fully gratified, let us hope for an immediate return to normal conditions. Possibly the means adopted may eventually result in benefit to the consumer, packer and producer. This much, however, is certain, that the result achieved might have been attained without jeopardising the greatest industry in the United States—an industry that during the past year paid to the farmers and stock-raisers of the country upwards of six hundred and fifty millions of dollars.

PUBLIC HEALTH AND VETERINARY SCIENCE.*

BY PROFESSOR BOYCE, M.B., F.R.S., THE UNIVERSITY, LIVERPOOL.

THE discussion of the question of the relationship of the veterinary surgeon to public health comes at a remarkably opportune time. The subject is indeed one which during the last few weeks has become a matter of very general public concern.

Following shortly upon the publication of a remarkable book, "The Jungle," by Mr. Sinclair, the state of affairs described by the Special Commission appointed by the President of the United States disclosed a very unsatisfactory state of affairs in the great meat packing houses of the United States. As is the custom in the United States, very strong public feeling was at once aroused, and legislation has been invoked to place the meat industries under a far more rigid and skilled control. In the meantime there have been in consequence immense losses in the preserved meat trades which have not been confined to the United States, but have even spread to this and other countries.

I believe, however, as far as the United States is concerned, that a very thorough putting in order of the house will be effected by the disclosures, and that the meat packing industries will again establish themselves in public favour. I have had some experience of the Federal sanitary control exercised from Washington, and I feel confident that the very skilled heads who there control the Public Health and Agricultural Bureaus will, if they are endowed with the proper powers, leave no stone unturned to bring about a thoroughly efficient sanitary control of the meat trade. The Bureaus of Public Health and of the Animal Industries have already on numerous important occasions proved their great practical value to the United States in protecting the public health, in rendering the food supply purer, and helping in numerous ways by their skilled advice and watchfulness many of the great industries of that country. In these respects Washington stands in the first rank, and the great assistance which the bureaus continually render to commerce might especially with advantage be noted by this country with a view of our adopting similarly comprehensive scientific organisations. How important efficient sanitary supervision is to the general welfare of the country is seen not only by what has already been accomplished in the United States, with its system of numerous separate State Governments, but also by what has been effected in Germany, Denmark, and other countries. The German meat industries have not suffered through what must have been at first felt as a very rigid and exacting system of inspection. On the contrary, the waste in the meat trade in that country has been diminished, and the public has gained a pure meat supply. One cannot but admire a nation which, following the advice of the great pathologist, Virchow, brought about a complete reform in the pork trade, and established it upon a firmer basis than ever before, and also which tries to meet every fresh exigency—which may diminish the reputation of its past meat supply, even when the supply of meat, for example, has become somewhat scanty—by new scientific methods placed in the hands of its inspecting veterinary surgeons. In Den-

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mark supervision of the milk trade has materially improved the commercial prospects of that country.

In England the action of the Local Government Board, backed up by strong public sentiment, has already brought about a great reform in a very considerable trade, that of the oyster industry. The merchants have begun to see that it was to their interest to furnish a pure supply to the public, and that they must skilfully supervise their fattening grounds. Already much organised reform has taken place, and I am informed that this year the state of the oyster industry is exceedingly good, and in marked contrast to that in the potted and tinned food trades.

Every trade resists more or less what it deems interference, but with the spread of skilled knowledge, resistance along certain lines becomes less; it becomes less necessary for legislation to forcibly bring about reform; the trade itself in many instances takes the nitiative as soon as it has been made authoritatively acquainted with the facts. I know of instances of this, and especially of an example of special interest to this discussion, where the cowkeepers have co-operated with the health authority, and have established an efficient veterinary supervision of their animals.

The Chicago tinned meat reports, the international movement for the prevention of tuberculosis, the increasing demand for a purer food supply, the injury which is done to the animal industries by the ravages of disease, the retardation of our progress in tropical countries through want of animals, all conduce to raise the question of the position of the veterinary surgeon to the first rank in economic importance. There is no longer any question that veterinary science can render an immense help to owners of the ever-increasing cattle-breeding stations throughout the world. Pasteur very many years ago showed what could be done in this respect in France. Theobald Smithe, working for the Bureau of Animal Industries, demonstrated the method of diminishing and stamping out Texas fever. Bang, on the one hand, by adopting general sanitary measures among the cattle in Denmark, and Behring on the other hand, and still more recently by means of vaccination, are combating the spread of tuberculosis in cattle. The condition verges on bankruptcy, which the Mauritians experienced a few years ago as the result of an epidemic of surra. The losses to the Indian Transport Service by the ravages of surra and dourine; the perpetual fear of the spread of cattle-plague in Egypt, a condition which perhaps, more than any other factor, would paralyse the phenomenal prosperity of that country; the necessity for fresh milk and animal food in many of our tropical possessions, the want of which now renders prolonged residence almost impossible; the equal necessity in these countries of cattle and horses for transport purpose should, as Nocard pointed out, shortly before his death, to the citizens of Liverpool, bring home to traders, agriculturists, and governments the necessity of a far greater supply of skilled veterinary assistance than exists at present. It is with gratification that one is enabled to record that there does appear to exist an evident desire on the part of merchants and governments to make greater use of the veterinary surgeon. The owners of Estancias have taken skilled veterinary advice, and administrations in Egypt, India, and the Colonies are deriving increased profit by the more extensive employment of

veterinary medical men. What is more striking of the increased activity in this direction than the fact that a Journal of Tropical Veterinary Science has recently been published in India by Messrs. Pease, Baldrey and Montgomery? There, however, still remains abundant room for the employment of the properly trained veterinary surgeon in India, the West Indies, and West and Central Africa, and perhaps now that the success of medical science in the preservation of health and of botanical and chemical science to the growing of cotton and rubber has been demonstrated upon a most extensive scale throughout our tropical empire, we may look forward to the far greater employment of veterinary science to further extend commerce in these possessions. That great changes can be brought about in these countries is evident. Just as Sierra Leone is no longer regarded as the white man's grave, and as the health generally throughout West Africa has been greatly improved owing to systematic medical effort, so there appears every reason to believe that it is possible to introduce and to maintain domesticated animals in countries in which it has hitherto been regarded as impossible.

The time has come when there should be no haphazard introduction of animals. Careful investigations should be made beforehand by competent veterinary men, not only of the diseases of domesticated and wild animals indigenous to the district and communicable to freshly introduced animals, but also of the animals introduced and kept under observation after having been exposed to infection in other districts.

The national importance of fully equipped veterinary surgeons in the Army has begun to be recognised, and the War Office has taken the important step of encouraging post-graduate work in veterinary medicine, just as the Colonial Office has insisted upon it in the case of medical men seeking posts in the Crown Colonies. There can be little doubt that the nation must have sustained very considerable losses in the recent war in South Africa owing to the want of sufficient veterinary officers; such losses should be obviated in the future.

Following on the progress made in bacteriological science a very large number of medical men have been employed in Europe, the United States and in this country upon the practical application of bacterial products and sera to the prevention of disease. To a very large degree this aspect of medical science has been monopolised by medical men even when the vaccines were destined for animals. It is a misfortune that hitherto, at any rate in this country, so little opportunity was available for the study of preventive and curative sera and vaccines amongst the veterinary profession.

Surely it is time that this subject should engage the attention of the veterinary schools, and that those in authority should seek the financial support which would render this possible. Many years ago the work of the medical school was confined solely to training for the profession, and whilst it was so confined to training students for a career it received little external aid. The adoption of medical research as an equally important function of the medical school, and the increase in consequence of the usefulness of these institutions to the nation, has had the effect of bringing in outside aid. A far more energetic effort should be made by the veterinary profession to

capture many of the posts which now, almost as a matter of routine, fall to medical men. The way to capture them is to be equipped.

In relation to the public health of this country the veterinary surgeon should occupy a far more prominent position than he does at present. It took a considerable time before municipalities and district councils saw the importance of engaging the whole services of medical men to supervise the health of the people; we are not even yet perfect in this respect, but a vast improvement has been made, and the death-rate in great towns has been greatly diminished. There has been a corresponding saving on many sides in municipal expenditure, and the medical department has been amply repaid. By strict medical supervision and the preventing of epidemics, the growth and expansion of larger towns has been able to take place without risk of the epidemics which would have inevitably occurred in past decades. To qualify for the posts of medical officers the medical men organised a special training, and now a large proportion of the medical officers of health have obtained the Diploma of Public Health granted by a number of medical bodies. The work of the Medical Officer is now very complex; analysts and numerous inspectors have been given him, and in some cases he is furnished with the services of a veterinary surgeon. Enough, however, has not been done in this direction. It has been assumed that the Medical Officer could equally well supervise the meat and milk supply of the district as well as attend to the health of the community. There is no doubt that the Medical Officer is best qualified from his position to judge of the ill-effects on man of diseased meat, unsound food of any kind, and contaminated milk, but his hands, in my judgment, are immensely strengthened if he has an expert who, like the Public Analyst, is able to give an authoritative opinion upon the meat or the milk or the contents of a tin of meat. At the present time there are not sufficient veterinary officers attached to the Health Departments. I am of opinion that one way in which a demand for these very necessary experts might be created would be by giving more attention to the public health side of the veterinary surgeon's training. Public opinion has, of course, to be educated, but let the veterinary profession take its part and make ready for a change which we consider inevitable in the interests of public health. No one should be better qualified than the veterinary surgeon to pronounce an opinion upon the soundness or otherwise of a carcase or piece of meat, or the fitness of an animal to provide milk. He should be the authority to decide upon the hygienic condition in which the animals are to be housed, slaughtered, and eventually disposed of.

There can be no question of the advantage of a trained veterinary surgeon as meat inspector. During a period of four or five years he has devoted himself to the study of animals in health and disease. That a less specially qualified officer should be chosen for the position of meat inspector appears to me to be not in the best interests of the public health.

The relation of the veterinary surgeon to the animal industries of the country are obviously important, since he has to be relied upon to prevent the spread of disease in this country and prevent its introduction. I am of opinion that they would be rendered still more useful and would still further demonstrate the great services which

they render the community if their duties as inspectors were strengthened by providing them with facilities for research into the infectious diseases which they have to observe.

The part which the veterinary surgeon is called upon to take in the interests of public health is an increasingly important one. New openings will inevitably be created both at home and abroad, and it is the duty of all those interested in the profession to educate the public to recognise its importance in public health matters, and to train and prepare the veterinary surgeon for the part which he should properly take.

INSECTS AND TICKS IN RELATION TO ANIMAL DISEASES.*

BY R. NEWSTEAD, A.L.S., ETC., LECTURER, LIVERPOOL SCHOOL OF TROPICAL MEDICINE

THE discoveries of the extraordinary part played by insects and ticks in the transmission of disease in man and the domesticated animals has, during recent years, made rapid strides in medical and veterinary science; and it is highly satisfactory to say that many of the discoveries have led to much more healthy conditions; and in the case of malaria and yellow fever these terrible diseases have, in certain regions, been reduced to the lowest possible minimum, if not entirely exterminated. It is not intended, however, to discuss the numerous animals which are concerned in the transmission of diseases in man; but to view the salient characteristics of those flies and ticks which are the known carriers of disease in the domesticated animals.

INSECTS.

Under this section we have a large number of blood-sucking species, of which the "tsetse-flies" and the "stable-flies" or "storm-flies" are well-known carriers of trypanosomiasis; but the horse-flies or gad-flies and the forest-flies may also be concerned in the transmission of disease in animals.

Of the tsetse-flies there are eight species and two or three well-marked varieties. These peculiar insects are strictly confined to the African continent, extending from the Gambia on the west to Somaliland on the east; southwards into North Zululand, and northwards as far as Lake Chad.

Although distributed over such a vast region these flies are extremely local, being confined to narrow tracts or zones known as "fly-belts" associated with streams and swamps.

Through the agency of *Glossina palpalis* and *G. fusca* the *Trypanosoma gambiense* of sleeping sickness is carried from man to man; and the tsetse disease of horses, &c. (*Trypanosoma brucei*), by *G. morsitans*, and possibly also by other members of the genus. These flies belong to the extensive family *Muscidæ* of which our common house-fly (*Musca domestica*) may be taken as a type; but in their structural characters the tsetse-flies are more closely related to the

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common stable-fly (*Stomoxys calcitrans*) of this country. They differ, however, in many essential details, especially in the characters of the wing neuration and the proboscis. The pupiparous habit of the female is, however, absolutely unique among the members of the Muscidæ.

Surra (*Trypanosoma evansi*) of India and the Philippine Islands is transmitted from one horse to another by the stable-fly (*Stomoxys calcitrans*), and possibly also by other members of the genus.

S. calcitrans is almost cosmopolitan in its distribution and an extremely common insect. In this country it is generally to be found in the immediate neighbourhood of stables, and the larval stages are passed in horse-dung. It is a vicious biter, and although it bears a striking resemblance to the common house-fly, may be distinguished from the latter by the form and character of the buccal organs.

It is highly probable that the gad-flies (*Tabanidæ*) and the forest-flies (*Hippoboscidæ*) are also effective carriers of trypanosomiasis, but the evidence, so far, is of a circumstantial nature.

Ticks (Ixodidæ.)

These animals are either permanent or remittent parasites which suck the blood of man, mammals and birds. All the female ticks lay eggs which produce hexapod larvæ. In those species affecting cattle and dogs, the larvæ are usually found congregated together on the summits of various grasses and other plants, where they remain for indefinite periods, awaiting a passing host. After a feed of blood the animal casts its skin and assumes the nymphal stage in which it attains an additional pair of legs. The animal then takes another feed of blood, casts its skin, and becomes sexually mature. In many instances the mature female is of the same size as the male, but after engorgement the former may increase in size from twenty to thirty diameters. The engorged female invariably leaves the host, seeks some place of concealment, lays her full complement of eggs, and then dies. The females are usually very prolific, in some instances as many as two or three thousand eggs being laid by a single individual.

The habits of these animals vary very considerably, in some instances (*Rhipicephalus decoloratus*, &c.) the whole life-cycle, with the exception of the egg, is passed on one host. In *R. evertsi* the larval and nymphal stages are passed on one auimal, and after effecting the second moult they seek another host. Or again, there are those ticks which leave the host at each successive moult, requiring three hosts to complete their metamorphoses, of which *R. appendiculatus* may be taken as an example.

Ticks are the intermediary hosts or carriers of the diseases known collectively as piroplasmoses, comprising a group of intercorpuscular protozoa belonging to the genus *Piroplasma*. These disease-producing protozoa are of the utmost importance to the agriculturist and settler, and the various diseases which they produce are known in different parts of the world as Malignant Jaundice in dogs, Blackwater and Red-water fever, Texas fever, Tick fever, Carceag, &c.

The various species of ticks which are known to be responsible for the transmission of these diseases are here briefly summarised.

Hæmaphysalis leachii is the tick which conveys the *Piroplasma canis* from dog to dog. In this case the adult females only can transmit the

disease, and these must be the progeny of an infected parent. Thus the piroplasma passes from the infected female tick through the eggs, the larvæ and nymphæ, the infected stage being reached only in the adult forms, which are alone capable of transmitting the disease to the animal from which they take a feed of blood. Thus it will be seen that both hosts are absolutely essential for the development of the organism producing the disease.

The intermediary host of *Piroplasma ovis* (Carceag) is *Rhipicephalus bursa*, in which the transmission is effected in the same way as in *P. canis*.

The ticks suspected of the transmission of *Piroplasma bigeminum* in South Africa and India are *Rhipicephalus decoloratus*, *R. evansi*, and *Hyalomma ægyptium*.

Texas fever (*Piroplasma bovis*), which has a world-wide distribution, is conveyed by the larval stage of *Rhipicephalus annulatus* and its varieties, and also by *Ixodes reduvius*. While the Rhodesian or African Coast fever (*P. parvum*) is probably transmitted by *Rhipicephalus appendiculatus*.

It may be seen, therefore, that ticks play an important part in the transmission of piroplasmosis, which may be counted among the most fatal diseases to which domestic animals are subject.

N.B.—This paper was supplemented by a series of lantern illustrations, accompanied by brief explanatory references.

THE HUMANE SLAUGHTERING OF ANIMALS FOR FOOD AND THE PUBLIC ABATTOIR QUESTION.

At the present time, when the question of public abattoirs is being again prominently brought forward in certain quarters, the following replies, which were sent to Captain Derriman, the Secretary of the Royal Society for the Prevention of Cruelty to Animals, a short time ago in response to a letter of enquiry, are of interest.

The questions were tabulated as follows, and were addressed, amongst others, to the authorities at the following towns: Glasgow, London, Manchester, Bristol, Brighton, Edinburgh, Montreal.

Information was especially asked for as regards the seven following points:—

(1) Address of public slaughter-house.
(2) Name of superintendent.
(3) Is the public slaughter-house a financial success?
(4) What instrument is used for slaughtering?
(5) Are there official slaughtermen, and are they licensed?
(6) Are butchers permitted to kill their own animals in the public slaughter-house? If so, what charge is demanded?
(7) Obtain any information possible as to plans, statistics, and appliances, as well as nature of buildings, in relation to the public slaughter-house.

The replies were as follows:—

GLASGOW.

Answer to Question 1.—There are three public slaughter-houses in Glasgow under the supervision of Mr. Walker, Superintendent.

Answer to Question 2.—There is also a slaughter-house at Yorkhill Wharf, where all foreign cattle are landed, and is under the supervision of Mr. Campbell.

Answer to Question 3.—The public slaughter-house is a financial success.

Answer to Question 4.—The poleaxe is the instrument used for slaughtering.

Answer to Question 5.—The slaughtermen are not officials, but are licensed by the magistrates. Usually two of them work in company, and they may employ one or two unlicensed assistants to dress the animals. These licensed men contract with various butchers to kill as required, and may kill for one or more butchers in Moore Street, Victoria Street, and Scott Street slaughter-houses all on the same day.

Answer to Question 6.—Butchers are permitted to kill their own animals in the public slaughter-house, but Mr. Walker says this is seldom done. The rates charged are the same, whether they are killed by the owner or by a licensed slaughterman, as the owner contracts with the licensed slaughterman, and not with the Corporation.

Answer to Question 7.—The buildings are of brick, with a stone frontage to the street. Seven of the rooms are fitted with the latest improvements in hydraulic cranes.

During 1904 the following numbers of animals were slaughtered: Oxen, 43,378; calves, 3,063; sheep, 196,233; lambs, 58,376; pigs, 60,235; goats, 16.

LONDON.

Answer to Question 1.—Caledonian Market (City of London Corporation), Islington.

Answer to Question 2.—Superintendent, Mr. James King, M.R.C.V.S.

Answer to Question 3.—No.

Answer to Question 4.—The instruments used are a stunner weighing 6 lbs., and having a handle varying from 2½ feet to 3 feet long, with a hickory knob. Poleaxe, steel-topped, the straight end being hollow, and very sharp at the edge, and the handle about 3 feet in length. An iron mallet weighing 2 lbs., with a handle about 18 inches long.

Answer to Question 5.—No official slaughtermen are employed.

Answer to Question 6.—The public slaughter-houses are rented out to various butchers, who employ their own men to kill. No licence required.

Answer to Question 7.—There are twenty slaughter-houses attached to this market, all of which are well built, lofty, dry, and well drained and ventilated. There are extensive lairages, thoroughly dry and warm, and well drained and ventilated; also an extensive building containing seven furnaces for the purpose of burning offal. All buildings are of brick, and thoroughly up to date. There are also arrangements for shutting out the beast that is being killed from the sight of others.

The numbers of animals slaughtered during 1904 are approximately

as follows: Beasts, 68,866; sheep, 528,811; calves, 1,972; pigs, 1,403; total, 601,052. These numbers are decreasing in consequence of the stoppage of the importation of foreign animals.

The method of slaughtering is as follows:—

(1) Pigs up to 20 stone are first stunned by a mallet, and afterwards stuck with a knife, the blade of which is 8 inches long, and very sharp and pointed at the top of the blade. All pigs over 20 stone in weight are poleaxed in the same way as beasts, with the poleaxe, obtainable at Thirking's, Long Lane, Smithfield, price about 10s. 6d.

(2) *Sheep.*—The animal is placed on its back on a brick about 4 feet long and 3 feet wide, and 9 inches deep, and the slaughterman inserts a very sharp and pointed knife, 8 inches long, into the left side of the throat, completely severing the jugular vein and afterwards makes a complete cut across the throat, death being immediate.

(3) *Calves.*—The animal's hind legs are fastened by looped ropes or chains to prevent struggling, and the animal is raised above the ground, head downwards by a pulley. It is then stunned by a blow on the head with a mallet, and then immediately stuck with a sharp pointed knife, about 8 inches long, which severs the jugular vein.

(4) A chain is placed round the neck of the animal, which is fastened to a staple which goes right through the wall. The animal is then killed by a blow with the poleaxe. In the case of a cow the blow is delivered on the back of the poll, severing the spinal column, but in the case of a bullock or bull the blow is delivered in front of the forehead.

Answer to Question 1.—Deptford Cattle Market (City of London Corporation), Deptford.

Answer to Question 2.—Superintendent Capt. George Philcox.

Answer to Question 3.—No.

Answer to Question 4.—Please see report on Caledonian Market.

Answer to Question 5.—No official slaughtermen employed.

Answer to Question 6.—Please see report on Caledonian Market.

Answer to Question 7.—Please see report on Caledonian Market, except as to numbers of animals slaughtered, which are approximately as follows: Beasts, 2,000 to 3,000 per week; pigs, none; calves, none; sheep, from 60 to 500 or 600 per week.

The number of animals slaughtered varies greatly according to shipment from abroad. There are fifty-eight slaughter-houses at this market, besides spacious drying and chilling rooms, all of which are thoroughly up to date.

The methods of slaughtering the animals are the same as at the Caledonian Market.

Manchester.

Answer to Question 1.—Water Street, Manchester.

Answer to Question 2.—Mr. Blackstock, Markets Department, Town Hall, Manchester.

Answer to Question 3.—Yes.

Answer to Question 4.—The ordinary poleaxe.

Answer to Question 5.—No official slaughtermen, and none licensed.

Answer to Question 6.—Any butcher is permitted to slaughter cattle in the public slaughter-house by payment of 1s. 6d. per head.

Answer to Question 7.—These slaughter-houses were built in 1872.

They are substantial, with plenty of room and lairs. I am unable to give further information in answer to Question 3. Animals slaughtered annually are about: Cattle, 30,000; sheep, 167,000; pigs, 14,000; calves, 1,200.

BRISTOL.

There is no public slaughter-house in Bristol.

The slaughtering is done in private slaughter-houses, except in respect of animals brought from abroad, which are slaughtered immediately on landing in slaughter-houses provided by the Corporation, but in these there is no official slaughterman.

Butchers kill there the animals they have purchased, and I am informed that the animals are pithed by the use of a poleaxe and cane.

BRIGHTON.

Answer to Question 1.—Hollingdean Road, Brighton.

Answer to Question 2.—James Alfred Cuckney.

Answer to Question 3.—No, because of the low rate of charges.

Answer to Question 4.—The poleaxe only.

Answer to Question 5.—There are no official slaughtermen, and none licensed.

Answer to Question 6.—Yes, butchers are permitted to kill their own animals in the public slaughter-house, and the charges are: Beasts, 1s. per head; calves, 6d. per head; sheep and lambs, 2d. each; and pigs, 4d. per head. The saleable offal being retained by the butchers.

Answer to Question 7.—The Brighton public slaughter-house was opened in 1894, and is built on a very good and convenient site, and on most up-to-date plans, and it cost about £14,000. The buildings are chiefly of brickwork, very substantial, with a railway siding from off the London, Brighton and South Coast Railway, and with proper cattle pens and convenience for lairage of the various animals, a charge being made (after the first forty-eight hours), viz., 3d. per day per beast, 2d. calves, 6d. per score of sheep and lambs, and 2d. each pig.

The appliances are all overhead hoists and travellers, by C. Mather and Sons, Edinburgh.

The statistics are as follows:—

Number of animals slaughtered at this house during the year 1895, 6,991; 1896, 11,184; 1897, 12,054; 1898, 12,650; 1899, 16,384; 1900, 18,304; 1901, 17,645; 1902, 20,318; 1903, 22,962; 1904, 25,805.

Amount received as tolls since the opening being as follows:—

November and December of year	1894	...	£	7	13	4
,, ,,	1895	...		102	15	4
,, ,,	1896	...		122	4	0
,, ,,	1897	...		115	7	7
,, ,,	1898	...		185	10	3
,, ,,	1899	...		243	9	4
,, ,,	1900	...		279	17	0
,, ,,	1901	...		271	13	10
,, ,,	1902	...		352	14	10
,, ,,	1903	...		402	11	10
,, ,,	1904	...		434	4	3

In addition to the above amounts, there is also an income of £85

per annum from the rental of private slaughter-houses at the Brighton abattoir.

Everything possible is done to get the various butchers to use the public slaughter-house, and to give up private places, of which there are now only thirty, under the supervision of the Superintendent, J. A. Cuckney (referred to) and his assistant.

EDINBURGH.

Answer to Question 3.—Yes, in so far that it is self-supporting, it is not allowed to become a burden on the rates. The following gate dues per head are levied: Cattle, 4½d.; calves, 3d.; pigs, 3d.; sheep ¾d. These dues are fixed to run for a period of three years, at the end of which they are raised or lowered as thought fit.

Answer to Question 4.—The ordinary poleaxe is in general use, the weight of said axe being about 5 lbs., and consists of axe for chopping off head and horns, and bolt-head for felling. The bolt-head measures about 2½ inches from base to tip, ¾ inch in diameter; is bored to nearly the whole length, with vent hole about one inch from point. Diameter of bore about one-half the diameter of bolt-head. The point of bolt-head is circular, sharp edged, and scooped out to the depth of ¾ inch. The diameter of bolt-head at point is about $\frac{1}{16}$ inch more than at the base, this preventing the bolt-head from becoming fixed in the animal's skull when it is felled, the slight increase of size at the point making its withdrawal more easy. After the beast is felled, it is "caned" and then bled. Sheep are killed by the knife in the ordinary way, and calves in a similar manner. Pigs are stunned by a blow on forehead with a wooden mallet, and afterwards knifed. A "Greener Humane Cattle Killer" is kept at the slaughter-house, and is sometimes used, but only on special occasions, such as demonstrations, &c. It is kept by the Superintendent, and used by him when required. This "Greener Killer" has been specially fitted with a longer stem than the ordinary "Greener," giving the operator a better chance when dealing with horned beasts.

Answer to Question 5.—Application for the post of slaughterman must be made as per form attached. Applicants must be recommended by two master butchers, after which they must, by their work, satisfy the Superintendent as to their fitness. If fit, they are enrolled.

Answer to Question 6.—Butchers are not permitted to kill their own cattle in the slaughter-house, but may go themselves or send one of their men for the purpose of assisting, all such persons being regarded as learners, and are placed under the guidance of an "official jobber," the latter being held responsible for the killing, and also damage (if any) to the hide. Before sending such men to assist, butchers must notify their intention of doing so to the Superintendent of the slaughter-house, and all such helpers are, while so employed, under the authority of the Superintendent. There is no charge made for this. The charge per head for slaughtering is as follows: Oxen, cows, bulls, 2s.; sheep, 4d.; pigs, 1s. (varying according to size). These charges are collected from the master butchers by the men who have performed the work. They are collected every Saturday. About 350 cattle and 2,500 sheep are slaughtered each week, the numbers varying.

Answer to Question 7.—The slaughter-house at Edinburgh is not a

new building, it having been erected in 1851. At present there are several structural alterations and improvements under consideration, but, as a scheme exists for the building of new slaughter-houses, with cattle marts and railway facilities adjoining, the alterations, &c., referred to are at present in abeyance. The booths for killing cattle and sheep are on either side of main street of slaughter-house; at the back of and joining are the pens occupied by the cattle, &c., waiting slaughter; the cattle entering by outer door of pen, and later through inner door to booth. Each booth measures about 24 feet by 20 feet, the pens outside corresponding in size; height of pen, 10 feet. In the centre of each booth is a revolving hand crane for hoisting the carcase while dressing, and when dressed, to the hooks overhead. The ring in the wall is placed at about 18 inches from the ground, and as the bullock's head, when drawn up by the rope, is about on a level with this ring, it is more likely to receive the full force of the blow when felled. The main door of booth is a sliding door, and is in two sections, top and bottom, in the bottom being a small "wicket." The doorway is wide enough to admit a full-sized lorry or cart. Pigs are killed and dressed in a shed apart from those used for cattle and sheep. Sheds for the cleaning of tripe, &c., are provided; 1s. 6d. being charged for each set of "heels" and "belly." Women are employed in this shed. Hide and tallow merchants have sheds for the carrying on of their business. Isolated sheds for carcases condemned, and destructor for disposing of such carcases are also provided. The other departments of slaughter-house are as follows: Superintendent's office, gatekeeper's office, meat inspector's office, refreshment stall (coffee, &c.), jobbers' waiting room.

Adjoining the slaughter-house is the meat market, the carcases being carted thereto, and not by the overhead trolley system, as is the case in some cities.

MONTREAL.

Answer to Question 3.—The city proper have ceased slaughtering and have adopted the system of licensing the abattoirs to responsible firms; and our inspectors report that it is working very well, everything very clean and the animals despatched with little suffering. Of course, as they are worked by private individuals or firms, I cannot tell you as to their financial working, but no doubt it pays well, as they seem prosperous.

Answer to Question 4.—The instruments used for killing are the poleaxe and knife. With the former the large cattle are knocked insensible; the throat is then cut and they are passed rapidly on. For smaller animals the knife alone is used.

Answer to Question 5.—The slaughtermen are skilled hands, employed by the licensed contracting firms.

Answer to Question 6.—Butchers are not permitted to kill their own animals, and the charges are: For large cattle, 50 cwt., 2s. 1d.; hogs, 30 cwt., 1s. 5½d.; calves, 15 cwt., 8¾d.; sheep, 10 cwt., 5d. There is no literature published by the city or these firms; I regret, therefore, that I am unable to obtain plans for you.

"VETERINARY EXAMINATIONS AND EDUCATION."

BY J. F. CRAIG, M.A., M.R.C.V.S., PROFESSOR OF ANATOMY IN THE ROYAL VETERINARY COLLEGE OF IRELAND.

I HAVE followed with some interest the discussion on the above subject which has been going on in the last few issues of the VETERINARY JOURNAL, and have looked out for some suggested changes which might be beneficial in the education of the veterinary surgeon.

The chief alteration which has so far been put forward as advantageous refers to the formation of the examining board. As "Syntax" and "M." have pointed out, however, the advantages to be gained by that change, viz., the introduction of internal examiners, are more than counterbalanced by the abuses which are apt to occur from the present constitution of the various teaching schools in the British Isles. It would be quite out of place to again go over the arguments which have been used for and against internal examiners; suffice it to say that they clearly indicate that an alteration of this nature would not, under existing circumstances, be a step in the right direction if adopted by the Royal College of Veterinary Surgeons.

We shall, therefore, require to look in other quarters for an improvement in veterinary education, and we shall not be long in finding out some points which call for attention when we take a glance at the subject of the curriculum. The two subjects to my mind which call for some change are those of stable management and veterinary hygiene. As for the former, I think it is indeed a pity that it should be placed on an equality with anatomy and physiology, and that a student who does brilliantly in the two latter subjects should be rejected at his professional examination simply because he is to some extent deficient in stable management.

If the subject is of such great importance as some people would have us believe, and is an index as to our future success as practitioners, then make stable management a preliminary subject, and stop a student from beginning his veterinary course until he obtains some knowledge of groom's work, but please do not continue the subject as equal to one of the most scientific in the student's curriculum. Horse-shoeing in the second year is taken along with stable management, and in my opinion the examination in this part of the work is little better than a farce. It consists in the identification of smith's utensils and the various forms of shoes, whether for normal or abnormal conditions, as well as the conditions under which these shoes would be used. The names applied depend to some extent upon the examiner, and are frequently local in their application. No practical preparation is required, and the examination of this nature cannot act as a gauge to the amount of knowledge of this work possessed by the student. If the student never knows more than what is required for this examination, may the gods pity him. The knowledge will not be of very much service to him in his after work. It would be quite easy to improve this subject by having some horses' feet and legs taken into the examination and by expecting the student to be able to prepare them for the shoe, indicate the shoe necessary, the preparation required, and his ability to put it on properly. If that was done, the knowledge that the student must possess would be of very great service to him in after life. Then, where are we going to put this

subject? The portion of it dealing with pathological conditions should be left entirely to surgery, and the normal horse-shoeing tacked on to veterinary hygiene, this latter being put down as one of the subjects for the second year.

Now I have something to say with regard to what appears to be the examiner's view of veterinary hygiene.

Hygiene is the subject which deals with the preservation of health, and includes the care that requires to be taken of the food, water, and housing (construction of buildings, air space, ventilation, drainage, &c.), not only for the adult but for the young. Judging from the recent examinations one is inclined to the belief that the examiner's idea on the subject is taken from the recent edition of Smith's "Hygiene," a manual which takes account not only of the subjects named above as belonging directly to hygiene, but also of preventive medicine. No doubt the student should know the general methods of disinfection in hygiene, but it seems to me that when this is applied in particular cases it is coming well within the scope of preventive medicine. Again, it is not to be expected that the student at the period of his course when he is examined on hygiene shall have an idea of parasitology, and the most favourable conditions for the development and transmisson of parasites such as the *Strongylus filaria*. Surely hygiene is not such a narrow subject that these parasites need be referred to when questions are being asked about the generalities of the subject at a professional examination. If questions are set on parasites the examiner must either have a very poor knowledge of the scope of the subject on which he is examining, or else he is very hard up for questions by which to test the knowledge of the student.

As thus indicated, the subject of veterinary hygiene requires revision on the part of the Royal College. It is the most ill-defined of all the subjects in the curriculum, and is wide enough without the necessity of dragging into it a subject which belongs essentially to the final year, viz., preventive medicine.

I have already suggested that veterinary hygiene should be taken as a subject for the second professional examination, and by this change would relieve the third year, thus allowing the student to take an active interest in veterinary medicine and surgery. At present the subject of anatomy is a dead letter in the third year, and the student has forgotten a good deal of it by the time he has begun to tackle surgery. Anatomy is the basis on which surgery is built, and the knowledge of it must be maintained if it is to be of service. Therefore, in the third year the place of veterinary hygiene might very well and profitably be taken up by the addition of regional anatomy, and its application to surgery, surgical anatomy. At the same time it should be compulsory for all third year students to attend lectures on veterinary medicine and surgery.

The above are the suggestions I have to put forward for the improvement of veterinary education. If there are objections to be made against these suggestions which would negative their practicability, then I hope that someone who is cognisant of these objections will raise them. In my criticisms of the present system I trust I have not been any more severe than the case required, and if I have been severe it is only with the object of drawing attention to the ill-defined condition of some of the subjects in the veterinary curriculum.

Clinical Articles.

ABDOMINAL FŒTATION.

BY WM. PAUER, M.R.C.V.S. BLACKWATER, HANTS.

THE subject, a black cat, about ten years old, was brought to my infirmary with a highly offensive vaginal discharge. Her owner informed me that she had always been in her possession and had had innumerable lots of kittens, and had apparently never been in ill-health until now. Examination by manipulation showed the presence of a kitten and this was removed by forceps without difficulty; it appeared to have been dead for some days. The uterus was washed out daily with antiseptics and the discharge ceased, and the cat appeared to be doing well and recovering. Five days afterwards, she refused food and became very listless. On manipulating the abdomen I detected, as I thought, another kitten, but I was unable to get hold of it with forceps, though I felt sure that I had fully emptied the uterus. The cat became weaker and died in a few days.

On making a *post-mortem* examination I found a fœtus (of about the usual size of a kitten at birth) situated outside the uterus and firmly enveloped by the omentum, about an inch behind the posterior borders of the spleen.

The fœtus was dry and mummified, but not septic; the body had normal skin and hair, but the skull was without skin, and the omentum was firmly adherent to it. All muscles and skin had disappeared from the limbs, the bones of which were normal. There was no trace of placenta or any blood-vessels to the fœtus, and it appeared that nourishment was obtained from the omentum. The uterus was normal and there was no connection between it and the fœtus. There was a little peritonitis present, together with a small amount of fluid in the abdomen, and the death of the animal appeared to be due to this.

From the condition of the fœtus, I think it probable that it had been in this position for at least a year, and that one, or perhaps several, normal gestations had since taken place.

AN INDIA-RUBBER RING AROUND A DOG'S TESTICLE.

BY S. HODGKINS AND SON, VETERINARY SURGEONS, HANLEY.

THE subject was a collie dog, whose owner could not account for the animal's anxious expression, emaciated condition, and capricious appetite. He brought the animal for us to see, and, on examination, we found that someone had put an india-rubber ring round one of its testicles. This had caused the testicle to become swollen to the size of a hen's egg, and also to suppurate. We put the patient on the operating table, washed the parts well with disinfectant and gave him chloroform; the scrotum was incised and the testicle removed with the clamps and iron. The dog made an uneventful recovery.

The owner afterwards found that the ring had been put on by a tramp in a lodging-house at the rear of his premises.

SOME CASES OF POISONING BY RHODODENDRON.

BY T. SLIPPER, F.R.C.V.S., SUTTON COLDFIELD.

On December 18 I was called to attend a number of ewes which had broken out of their pasture into an adjoining plantation during the night. When I got there I found six of them lying in different portions of the field in a paralysed condition, the head being turned backward towards the spine and the eyeballs looking towards the top of the head. Some fifteen others were also poisoned, but not so severely. The symptoms they presented were those of dulness, abdominal pain, continual grating of the teeth, grunting, and kicking at the abdomen. The ears were drooping, and some of the ewes were sick. It was only by examining the vomit that I discovered what had really been the cause of the illness, and in this I found portions of the green leaves of the rhododendron. I immediately prescribed a mixture of castor oil and chlorodyne, and, with one exception, they made an excellent recovery.

AN INTERESTING CASE OF EMPHYSEMA IN THE DOG.

BY FREDERICK HOBDAY, F.R.C.V.S., KENSINGTON.

On June 7 a fox-terrier, male, aged about five years, was brought into hospital with a history that it had been fighting a few hours before, and had been seized by the throat. The owner said that since the infliction of the wound, which could be plainly seen as an abrasion directly over the trachea, and which looked as if it had been caused by the fangs of another dog, the skin of the throat, the head and shoulders had become puffed out and swollen, giving rise to a crackling sensation when the skin was pressed upon by the hand.

When I saw the dog, the whole of the fore parts were enormously emphysematous and the eyes looked merely like two slits. The head and face were very much disfigured. The animal was placed in the kennel and kept at rest, the skin being punctured in several places with the point of a scalpel. The air, when gentle pressure was applied, hissed out of these punctures and the dog obtained instant relief. On the following morning, at eight o'clock, the kennel-man summoned me hastily with a message that the dog was dying. I found the patient on its side, and apparently at its last gasp, the whole of the body being enormously distended like a balloon. Apparently death was taking place from asphyxia. I quickly slit the skin with the scalpel in a dozen places on the shoulders, throat, head and thighs, and rapidly expelled the air from the subcutaneous connective tissue, applying artificial respiration afterwards. In a few minutes the dog got up and looked about him in a dazed manner. The skin was pressed three or four times during the day, and at night the patient ate a small meal.

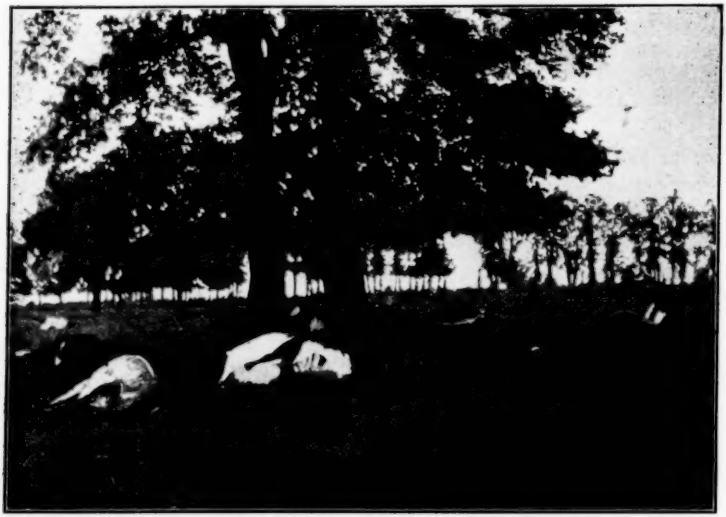
During the next week it was necessary to puncture the skin in numerous places at least once, and generally twice, a day, especially if the dog barked a lot or jumped about with excitement. The air was then gently expelled by steady pressure. At the end of ten days the

internal original wound had apparently become completely closed, for the patient retained his normal appearance, and left hospital on the 20th, permanently cured.

THE RESULT OF A STROKE OF LIGHTNING.

BY W. N. THOMPSON, M.R.C.V.S., HULLAND WARD, DERBYSHIRE.

THIS photograph represents what was probably as disastrous a result as has ever happened in this country from a single stroke of lightning.



I was called by a farmer in the neighbourhood to see a number of bullocks which were lying dead under a tree in the middle of a field. There were fourteen in all, lying in various attitudes stretched out on the grass around and under two large trees, under which the animals had apparently congregated for shelter.

A very heavy thunderstorm, accompanied by vivid lightning, had passed over the district during the night, with the disastrous result as photographed here.

A CASE OF FRACTURE DUE TO VIOLENT MUSCULAR CONTRACTION.

BY LIEUT. T. A. NICHOLAS, A.V.C., SECUNDERABAD.

THE subject was a camel, which at the time of the accident was being ridden into camp. Within about two miles of camp—from some unknown cause—the beast stumbled, but managed to recover itself. It

was then noticed that the animal was unable to walk. I was sent for, and upon examining the off shoulder, I found a large and painful swelling in this region. The limb was swinging and turned outwards, and on manipulation distinct crepitations could be heard. I ordered the patient to be destroyed. On *post-mortem* examination I found a complete (longitudinal) fracture of the humerus. There were no wounds, &c., about the camel to indicate violent contact with anything. I therefore believe this to be a case of fracture due to muscular contraction.*

MELANOTIC SARCOMA IN THE CAPUT MUSCLES.

BY FREDERICK HOBDAY, F.R.C.V.S., KENSINGTON.

THE subject was an aged grey cab gelding, which had been in the owner's possession for seven years and had been very lame for about a month.

Upon examination a hard and defined tumour-like swelling about the size of a duck's egg was perceptible in the caput muscles.

According to the owner's account he had noticed this for about a month, but it had recently got rapidly larger.

Hot fomentations and an opiate lotion were applied for a week, but as there was no alteration it was decided that surgical measures should be resorted to.

On February 7, under the local anæsthetic influence of a mixture of cocaine and eucaine, the growth was dissected out. The wound healed without any trouble and the animal recovered sufficiently to do a little work, but in April it became suddenly lame again and the tumour could be distinctly felt to be reforming.

As the horse was aged the owner decided to have it destroyed. The tumour weighed 2¼ ounces, and proved upon examination to be a melanotic sarcoma.

AMPUTATION OF A SEPTIC UTERUS AND RECOVERY.

BY WM. PAUER, M.R.C.V.S., BLACKWATER.

THE subject, a wire-haired fox terrier, about five years old, had had several litters of puppies and had always been healthy.

The owner told me that three days ago the bitch had given birth to three pups, but that she had been in her present condition since then.

I found that the complete uterus was prolapsed and in a highly gangrenous condition. The bitch appeared to be suffering from septic-poisoning, and vomition was frequent. I considered that her chances of recovery after replacement would be very slight, and advised the owner to allow amputation.

The neck of the uterus was tied with catgut by multiple ligation, and the organ was then cut off close to the ligature. After thorough disinfection in a solution of chinosol the vagina was replaced. In four days' time she was able to retain a little milk, and from that time there was a gradual improvement in her condition. A month afterwards she was apparently in perfect health.

* A photograph of the fractured humerus accompanied this article, but it was not clear enough for satisfactory reproduction.

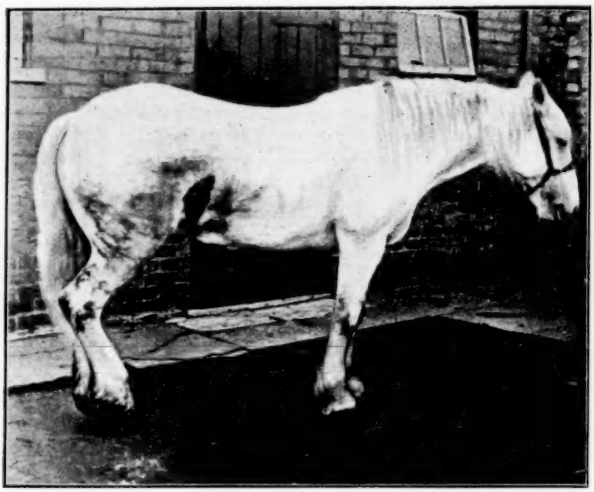
A CASE OF LAPARO-ENTEROTOMY

BY H. P. LEWIS, ROYAL VETERINARY COLLEGE, LONDON.

On September 13, 1902, I was called to attend a case of colic. I found the mare showing slight uneasiness, but not at all violent. Temperature 101·3, pulse 66. I gave a sedative draught and left instructions as to how to proceed.

September 14, 9.30 a.m. Condition similar to previous day. I could now detect a calculus by rectal examination. 3 p.m. Under chloroform and with strict attention to antiseptics I performed laparo-enterotomy, removing a tolerably large calculus. The operation lasted ninety-five minutes. The mare was quickly on her feet, and appeared little the worse for the operation. The same evening her temperature was 103·2; pulse, 66; respirations, 14.

Sept. 15	...	Temp.	103	Pulse	56	Resp.	12	Gave enema.
,, 16	...	,,	103	,,	50	,,	12	,,
,, 17	...	,,	103	,,	56	,,	12	,,
,, 18		,,	105	,,	80	,,	—	—
,, 19	...		—		—		—	Death.



The site of incision.

The external wound in the flank was treated daily with antiseptics and made rapid progress towards healing. The wound in the intestine where the calculus was removed was also perfect. In the large colon were found seven large and sixty small calculi. There was a considerable amount of food in the intestines anterior to the calculi, although the mare had taken no solid food for seven days, nor had she defæcated during that period. The largest calculus removed on *post mortem* weighed 5 lb. 7 oz.

A CASE OF PLEURO-PNEUMONIA SUPERVENING UPON BILIOUS FEVER.

BY LIEUT. A. LEANING, A.V.C., REMOUNT DEPÔT, MOOI RIVER, NATAL.

A REMOUNT was admitted to the sick lines on December 20 last, affected with bilious fever. There were intensely icteric membranes, but the temperature was only slightly elevated, and the animal fed fairly well for the first two weeks and seemed to be progressing satisfactorily. On January 10, 1906, it had a relapse and refused food, gradually becoming worse, and on January 17, 1906, I noticed symptoms of pleurisy. The temperature went up to 103° F, and the horse refused all food and became very emaciated, a fœtid discharge coming from both nostrils. It never rallied, and died on January 22, 1906.

The *post-mortem* examination revealed the following:—The thorax contained about two gallons of straw-coloured fœtid effusion, with a quantity of fibrinous lymph floating about it. The pleuræ were adherent to the lungs. The lungs had a lot of abscesses just beneath the surface, most marked in the anterior lobe of each; these were full of a very evil-smelling, dull-coloured, creamy pus. There was general red hepatisation in both lungs. The pericardium contained about half-a-pint of blood-tinged effusion. The heart was enlarged and flabby.

Abdomen. The liver was swollen, of a dark amber colour, and on cutting into the tissue a quantity of bile oozed out. The intestines were empty and blanched, the duodenum containing some free bile.

The cortices of both kidneys were intensely congested.

EXTRACTS FROM CLINICAL NOTES MADE IN 1814.

BY JOHN DUNSTAN, ST. MELLION, CORNWALL.

THE following extracts are taken from a very interesting clinical case book which has, by their request, been lent to the editors of the VETERINARY JOURNAL, and which was compiled in the early part of the last century by the late Mr. John Dunstan, veterinary surgeon, the grandfather of the present owner of the practice, which has altogether been in the family for six generations.

The present Mr. Dunstan has three sons, qualified members of the profession, the eldest of whom until recently occupied the professorship of surgery in the Royal Veterinary College of Edinburgh. Truly a veterinary family.

The notes illustrate well what successful results followed surgical operations even in the pre-antiseptic days, if only attention was paid to the principles of ordinary cleanliness.

A CASE OF RUPTURE.

1814. Mr. W.'s horse cured of a rupture near the hind girth place, of a long standing. Daniel Hart, from Tarpoint, tried bandage and different applications, but to no purpose. I opened the skin very large and found a callous inside. I was obliged to cut it out and I had a great difficulty to keep back the entrails whilst I was performing the operation. I sewed the inside film with thread and stitched the skin; dressed the wound inside with Friar's balsam and

spirits of wine, outside with oil of spike, spirits of turpentine, spirits of wine and opodeldoc. The horse cured in three weeks.

A Diseased Udder.

1814. Mr. G. H.'s cow cured of a bad udder by cutting off 10¾ lbs.; only one teat cut off; put stitches across the wound to keep in the dressing. Dressing with spirits, green Basilicon ointment, train oil, and Armenian bole, as the case required. Blue-stone lotion to keep back the proud flesh.

Prolapse of the Uterus.

1815. Mr. R. H. had a cow calved in the field; womb, bed, calf, and all came off together. The cow running about the field when I came. I put her in the house, cast her, and, hanged up by the heels, first took off the bed, washed the part clean and fomented it well with hot water, but it was so much swollen I had great difficulty to replace it. Dressed her with Clater's oils, ringed her with an iron ring and two pieces of leather. She did well.

Poll Evil.

1815. Horse cured of a poll evil by a seton first, then caustic, dressing with lotion, train oil, and Armenian bole.

Spavin.

1814. Mr. S.'s horse cured of a large bone spavin by punching all over the spavin and rubbed in arsenic powder, but firing and blistering is a much better plan.

A Thoropin.

1815. Mr. H.'s horse had a very large thoropin inside and outside. I opened the swelling, nothing but clear water came out in different places. Cured.

A Quittor.

1815. Mr. W. L., of Minchincott. A quittor. Drew the sole off the foot, blistering and cauterising above the hoof. Cured.

Poll Evil.

1816. Mr. William P. A mare with poll evil cured by running a hot iron both sides of the neck; caustic and blue lotion, train oil, and Armenian bole.

Punctured Foot.

1817. Mr. S. T. Horse cured by drawing nail of the foot. Lame more than six months by a pin in the foot.

Difficult Parturition.

1817. Mr. T. L., of Saltash. Taking off a calf from a cow, with ten men's assistance.

(*To be continued.*)

ABSTRACT OF THE PROCEEDINGS OF THE TWENTY-THIRD CONGRESS OF THE ROYAL SANITARY INSTITUTE.*

THE Congress included general addresses and lectures. Three Section Meetings for two days each, dealing with

(1) Sanitary Science and Preventive Medicine, presided over by Sir William J. Collins, M.D., F.R.C.S., B.Sc., D.P.H., J.P., M.P.

(2) Engineering and Architecture, presided over by Edwin T. Hall, V.P.R.I.B.A.

(3) Physics, Chemistry, and Biology, presided over by W. N. Shaw, M.A., B.Sc., F.R.S.

SPECIAL CONFERENCES.

Municipal Representatives, presided over by Councillor Colston Wintle, M.R.C.S., Chairman of the Health Committee, Bristol.

Medical Officers of Health, presided over by D. S. Davis, M.D., D.P.H., Medical Officer of Health, Bristol.

Engineers and Surveyors to County and other Sanitary Authorities, presided over by H. Percy Boulnois, M.Inst.C.E.

Veterinary Inspectors, presided over by Frank Leigh, F.R.C.V.S.

Sanitary Inspectors, presided over by A. E. Hudson, Chief Sanitary Inspector, Cheltenham.

Of Women on Hygiene, presided over by her Grace the Duchess of Beaufort.

On the Hygiene of School Life, presided over by the Right Rev. the Lord Bishop of Hereford.

The following set subjects were arranged for discussion:—

Section I. SANITARY SCIENCE AND PREVENTIVE MEDICINE.—"An International System of the Notification of the more Serious Infectious Diseases," introduced by E. Walford, M.D., D.P.H.

Section II. ENGINEERING AND ARCHITECTURE.—"The Construction of Isolated Homes for the Aged Poor *versus* the Workhouse," introduced by A. Saxon Snell, F.R.I.B.A.

Section III. PHYSICS, CHEMISTRY, AND BIOLOGY.—"The Influence of Dust on Health," introduced by Phillip Boobbyer, M.D.

Conference of Municipal Representatives.—"The Rational Extension of Modern Cities," introduced by Arthur Richardson, M.P.

Conference of Engineers and Surveyors.—"Rural Road Construction and Maintenance," introduced by R. Phillips, M.Inst.C.E.

Conference of Medical Officers of Health.—"Amendment of Existing Laws and the Need of Additional Powers for Greater Efficiency in Public Health Administration."

Conference of Veterinary Inspectors.—"Milk Contamination in Collection and Transit," introduced by J. S. Lloyd, F.R.C.V.S.

Conference of Sanitary Inspectors.—"Advantages of Public Abattoirs," introduced by Geo. Anderson.

Conference of Women on Hygiene.—"Suggestions for the Improvement of Infant Feeding," introduced by Miss Edith Evans.

Conference on the Hygiene of School Life.—"Instruction and Hygiene in Training Colleges," introduced by Miss Alice Ravenhill.

* Held at Bristol from July 9 to 14, 1906.

The following were the order of proceedings:—

MONDAY, JULY 9. 12.30 p.m.—Reception of members and delegates in the Council House by the Right Hon. the Lord Mayor.

1.30 p.m.—Public luncheon in Royal Hotel, limited to 300.

3 p.m.—Opening of the Health Exhibition in the Drill Hall, Queen's Road, by the Right Hon. the Lord Mayor.

7 p.m. to 8 p.m.—Organ recitals and reception of the members of the Congress in the Victoria Rooms by the High Sheriff.

8 p.m.—Inaugural address to the Congress, in the Victoria Rooms, by the Right Hon. Sir Edward Fry, P.C., D.C.L., LL.D., F.R.S.

TUESDAY, JULY 10. 10 a.m.—Meeting of Section I. (Sanitary science and preventive medicine); conferences of municipal representatives, and engineers and surveyors to county and other sanitary authorities, in the Victoria Rooms, University College, and the Blind Asylum.

3.30 p.m.—Visits to local places of interest, including the Corporation Infectious Diseases Hospital at Ham Green; the Bristol Tramway Power Company Station; Messrs. J. S. Fry and Sons; and the London, Gloucester, and North Hants Working Dairy.

WEDNESDAY, JULY 11. 10 a.m.—Meetings of Section II. (Engineering and architecture); Section I. (Sanitary science and preventive medicine); conferences on hygiene of school life and sanitary inspectors, in the University College, Victoria Rooms, and the Blind Asylum.

3.30 p.m.—Garden party in the grounds of Goldney House, Clifton, by permission of the Right Hon. Lewis Fry, P.C.

8 p.m.—Lecture to the Congress, in the Victoria Rooms, by Prof. Lloyd Morgan, LL.D., F.R.S., on "The Relation of Heredity to Physical Degeneration."

THURSDAY, JULY 12. 10 a.m.—Meetings of Section III. (Physics, chemistry, and biology); Section II. (Engineering and architecture); conferences of medical officers of health and women on hygiene, in the Blind Asylum, University College, and Victoria Rooms.

3 p.m.—Garden parties and visits to local places of interest, including a garden party at Failand House, Failand, at the invitation of the President of the Congress, the Right Hon. Sir Edward Fry, P.C., F.R.S., and Lady Fry; a garden party at King's Weston, at the invitation of Mr. and Mrs. P. Napier Miles; and visits to the King Edward Dock (in course of construction at Avonmouth), and circular tours to inspect the following: electric light works, refuse destructor and sewage disposal works, public baths and washhouse, municipal lodging house, public schools, libraries, and to the gas and waterworks and the larger manufactories.

8 p.m.—Conversazione and reception in the Art Gallery, by the Right Hon. the Lord Mayor.

FRIDAY, JULY 13. 10 a.m.—Meeting of Section III. (Physics, chemistry, and biology); conference of veterinary inspectors, in the Blind Asylum and University College.

1.50 p.m.—Closing meeting in the Victoria Rooms.

3 p.m. to 6 p.m.—Reception in the Health Exhibition.

8 p.m.—Popular lecture by Councillor W. F. Anderson, J.P., Chairman of Health Committee, Glasgow.

SATURDAY, JULY 14.—Excursions to Cheddar, Wells, Blagdon,

Wye Valley, Chepstow, Tintern, Bath, Weston-super-Mare, Minehead, Lynton, Ilfracombe, &c.

The officials of the veterinary section were as follows:—*President:* Frank Leigh, F.R.C.V.S.; *Vice-Presidents:* W. Blumsome, M.R.C.V.S., D. G. Davies, M.R.C.V.S., G. H. Elder, M.R.C.V.S., Thomas A. Huband, F.R.C.V.S., W. R. Jermyn, M.R.C.V.S., G. Parr, M.R.C.V.S., Prof. J. Penberthy, M.R.C.V.S., A. C. Stewart, M.R.C.V.S., W. A. Welch, M.R.C.V.S.; *Secretaries:* W. J. Cade, M.R.C.V.S., George Bishop, M.R.C.V.S.; *Recording Secretary:* W. Hunting, F.R.C.V.S., London.

The members of the profession present included Messrs. Angwin, Butters, Bishop, Cade, J. Colman, D. P. Davies, Grasby, W. Hunting, Hobday, James, senior (Frome), Jermyn, Lloyd (Sheffield), Leigh, Peacey, Villar, and Welch.

As the meeting was held in conjunction with medical officers of health and sanitary inspectors, this happy idea, which resulted in a very prolonged and animated discussion which never flagged for an instant, brought out opinions on every aspect of the subjects which were brought forward. The meeting was one of the most numerously attended of the whole congress, and the opinions of such well-known medical men as Sir Charles Cameron, Dr. Rideal, Dr. Savage, Dr. Armstrong, and other medical officers of health were given alternately with those of members of the veterinary profession and eminent sanitary officials; it was pleasing to note throughout the friendly tone with which all unanimously acknowledged that the veterinarian was an essential factor in all sanitary work to do with animals.

The papers of Mr. Lloyd and Dr. Savage on the milk question were read consecutively, the discussion on the two being taken together.

Professor Dunstan's paper on Anthrax was read afterwards, and discussed mainly by the veterinary surgeons themselves.*

Abstract of the Address by MR. FRANK LEIGH, F.R.C.V.S., *President of the Conference.*

Probably my being a resident here, an old Bristol boy born and bred, together with my associations in municipal matters, are the sole reasons for my occupying the position of President of the Congress.

When I was asked by the Royal Sanitary Institute to accept this important office, I felt I was not competent to fulfil the duties with credit to our profession; but when our recording secretary promised his assistance I became inspired with confidence, knowing that whatever he promised he would most certainly carry out. I feel that I have at least one characteristic which will help to fit me for the post, that is, a firm desire to do my best, and a devout faith in the assistance you will all give me. Fortunately success does not depend on the President, it rests upon the papers to be read and the contributions given in debate by you all.

The citizens of Bristol extend to you all a hearty welcome; they have done their best to provide every facility for enjoyment, scientifically and socially, and I sincerely hope that you gentlemen will take

* The papers are published in full in the official Journal of the Royal Sanitary Institute.

advantage of those facilities. Bristol, I regret to say, has not taken up the position she should in the veterinary scientific world, this being the first time in my experience of twenty-two years as a practitioner, we have ever had a meeting of veterinary surgeons in Bristol, either in connection with a sanitary congress or a veterinary society. I hope, gentlemen, that this may be a fruitful source of development, and that veterinary surgeons, neighbours of mine practising in and around Bristol, may join with me, and let us come out of that hybernating state in which we have so long existed. Let us come forward and identify ourselves in scientific matters associated with our city and the West of England, and let us prove ourselves to be worthy members of a worthy profession.

I do not propose to waste your time by many remarks of my own, but I must say that no two subjects could possibly be of greater interest to veterinary surgeons than the two entrusted to Mr. Lloyd and Mr. Dunstan; they interest in fact, a far wider class.

We are all consumers of milk, and its contamination is a real and serious matter to the whole population. I consider that the special food of infants and invalids should be free from danger, and that the strictest precautions should be adopted to render it largely available and of absolute purity. But there is another side of the question, and that is that the producer should not be unfairly harassed by unnecessary regulations, or by mistaken suspicions. The cowkeeper and dairyman carry on business which is to some extent suspect. Whenever an outbreak of disease occurs, milk is one of the first articles suspected, and where human life is concerned the earliest interference with a possible cause is justifiable. But more than one instance has occurred where grave injustice has been inflicted upon the producer or purveyor of milk. Regulations for the protection of man should be so carried out as to give the least possible injury to the milk producer and meat purveyor.

The medical officer of health and the sanitary inspector are not the men best acquainted with cattle in health and disease. The public are best protected without injury to the farmer, butcher, and dairyman, by the combined wisdom of those officers and the assistance of a trained veterinarian. Many years ago the supposed discovery at Hendon of some direct connection between an outbreak of scarlet fever in man and an unrecognised disease of cows led to a gross injustice to a cowkeeper. This would have been prevented by recognition of the services of a veterinarian. It is not quite fair to assume that there are serious diseases of animals transmissible to man which have escaped the notice of veterinary observers; such assumption should at any rate be followed by the invitation of veterinary co-operation in investigating the outbreak.

The second paper we have to consider relates to anthrax—a disease which only attacks man as the result of contagion derived from a previous disease in animals. Whether man is affected directly from handling a diseased animal in this country or from the hide, hair or wool infected in a foreign country, it is always primarily a disease of animals. Prevention then must always be directed to the control of the disease in animals. So far as the home animal goes, our regulations seem sufficient if properly carried out. As to the foreign animal which sends in infective material, I cannot but think some greater care

might be taken at our ports. If it be true that wool, hair, and hides from certain foreign parts are always infected they should be stopped from importation. I quite recognise that no harassing restrictions on trade should be imposed, but where human life is concerned deadly dangerous material should be prohibited.

The mere existence of a law prohibiting such dangerous imports as "dropped fleeces," which means often the fleece removed from an animal dead of anthrax, would soon force the vendors of such material to be more careful, and to cease sending it.

Every importation of anthrax infected material is a danger not only to the workers employed upon it but to the home stock of the country. The spores of the anthrax bacillus are not easily killed, and the waste from works goes as manure to our own fields and pastures to spread disease among our own stock.

I need not dwell on these two subjects; the papers before us will treat of them with far more fulness and force than I can do.

The veterinary section of a congress on sanitation is comparatively a small part, but it is an indispensable one. So long as there are diseases of animals transmissible to man, so long as animals supply food for man, and so long as animal products—hair, wool, and hides—are necessary to the wants of civilisation, so long must the veterinarian play an important part in advising and protecting the community.

Before the appearance of cattle-plague in 1865, nothing was done in the way of public veterinary hygiene. Veterinary practitioners gave assistance merely as private advisers, and although their help was valuable it was limited to the individual, or to a small district. The cattle plague caused such fearful losses in England that attention was directed to the class of men who stayed its ravages and finally stamped it out.

The Government recognised the value of veterinary assistance, not only in the treatment of diseases of animals, but in the far more important and economical matter of prevention. Legislation followed, and was under the direction of veterinarians. Success was attained and pleuro-pneumonia and foot-and-mouth disease were eradicated from the country. When the first Contagious Diseases of Animals Act was passed in 1869 very little attention was paid to the diseases transmissible to man, but gradually enlightenment spread, and rabies and anthrax were added to the scheduled diseases. The first of these was attacked solely because of its danger to man; the regulations were gradually improved and made more rigid, with the result that within a space of about four years rabies in dogs was stamped out and hydrophobia in man disappeared from the kingdom.

Glanders is another disease that has been for a long time scheduled under our Diseases of Animals Act, but the regulations for its suppression are antiquated and inefficient. No one knows how many human lives are destroyed by this disease of horses, but it is gradually being recognised that they far exceed the number found in the returns of the Registrar-General. The loss of human life would cease entirely from this cause on the suppression of the disease in the horse, and it really seems inexcusable that our Government ignores the serious danger to human life and permits an annual loss of about 2,000 horses.

Tuberculosis exists in animals and man, and whilst a Commission is still at work on the subject I refrain from any long argument as to the danger of the disease. It is not provided for by legislation. Under the Dairies, Cowsheds, and Milkshops Order a cow with a tuberculous udder may be ordered to be removed; but it may pass into another cowshed, it may be used for breeding purposes, or it may be converted into meat for man.

The loss to the agriculturist from this contagious disease is ignored by Government, and the danger to the public from infected milk is met only by the almost useless provisions of the Dairies and Cowsheds Order. The whole danger to man might be prevented by the scheduling of the disease under the Diseases of Animals Act, and the loss to farmers would every year be appreciably diminished.

During the last ten years there has certainly been a great awakening to the importance of veterinary hygiene. The Board of Agriculture has made greater use of the services of trained veterinary surgeons. Local authorities have utilised our services as meat inspectors, and consult us regularly as to the outbreaks of disease likely to devastate stock or infect man. Still, there is much more room for progress, and I welcome these congresses as means to bring about a further appreciation of veterinary science as an important factor in the practice of sanitation and in the work of public health.

I have no desire to magnify the importance of this section of the Congress. In a few years I earnestly believe it will take its place as an essential part of any organised conference on hygienic matters; and I should not to-day have insisted upon its importance had I not felt that it is capable of rendering more valuable services than are generally recognised.

MILK CONTAMINATION IN COLLECTION AND TRANSIT.

Abstract from the Paper by J. S. Lloyd, F.R.C.V.S.(London), D.V.S.M. Vict.(Manchester), *Veterinary Inspector for the City of Sheffield.*

In dealing with the question of milk contamination, it is perhaps, best in the first instance to define "clean milk." The only practical answer to, What is clean milk? is to state that it is milk drawn from the healthy udders of healthy cows under the greatest practical precautions against contamination that can possibly be taken, both during milking and whilst in transit to the consumers.

Proof of Contamination.

The changes taking place in contaminated milk can be studied in several ways; physically, chemically, bacteriologically.

The physical examination may be by means of the naked eye, noting alterations in colour or consistency; by taste, noting alterations in taste such as acidity or bitterness; or by smell, noting the presence of unnatural odours absorbed by the milk, such as, for example, from fish, turpentine, paraffin, camphor, garlic, &c., or which may be caused by bacterial changes in the milk itself. Other physical proofs of contaminated milk are, however, often met

with. One of the most common is sedimentation, or the falling of solid particles of dirt to the bottom of the vessel in which milk is contained. This can be seen in almost any basin of milk produced under ordinary farm conditions.

Another common proof of dirt contamination is seen in the slime from a "separator" after use. Here, owing to centrifugul force, the dirt being heaviest, is thrown to the side of the tube or bowl of the separator, whence it may be scraped off as a thick, dirty, sometimes nearly black, slime.

In milk which has been produced under exceptionally dirty and dusty conditions, and particularly if then only imperfectly sieved, large quantities of filth, dust, hair, straw, &c., may be seen floating on the surface. In a case of this kind some year or so ago a farmer was fined £25 and costs under Section 47, Public Health (London) Act, 1891, for selling milk unfit for the food of man.

Milk can also be examined bacteriologically for contamination, in fact, this is the most scientific and at the same time the most accurate method of doing so. Microscopic examination of the milk and of the sediment obtained by centrifugalisation, may reveal the presence of colostrum, blood or pus cells, algæ, fibres, moulds, yeasts, hair, &c. Films can also be examined to discover the presence of specific bacteria such as the bacillus of tuberculosis, streptococci, actinomyces, and such acid-fast micro-organisms as the timothy grass or mistal bacilli.

The most delicate and also most accurate bacteriological test for suspected milk is its inoculation into test animals such as the guinea-pig. This test will in many cases reveal the presence of tubercular infection when an extended microscopic examination fails to discover the tubercle bacilli.

Numerous series of examinations of contaminated milk have been made all over the world, of which the following may be taken as examples:—

Dr. Collingridge, Medical Officer of Health, City of London, in his annual report for 1904, states that out of 39 samples examined, over 50 per cent. were not clean or pure. Professor Delépine ("Food Poisoning and Epidemic Diarrhœa") states, 10 per cent. of non-refrigerated milk when inoculated into guinea-pigs caused death in less than ten days, whilst with refrigerated milk the percentage of deaths was as follows:—1898, 2·7 per cent.; 1899, 1·14 per cent.; 1900, 3·6 per cent.; 1901, 1·24 per cent.

Dr. A. C. Houston ("The Bacteriological Examination of Milk") conducted a series of investigations of milk procured under different conditions, and found that generally the samples taken from the shops of purveyors and dairymen were the worst contaminated, those taken direct from railway churns being next in the scale.

Contamination at the Farm.

The sources here are are insanitary cowsheds, dirty or diseased cows, especially cows with diseased udders, unclean and diseased milkers, dirty milk vessels, exposure of milk to dirt, dust, dogs, cats, and flies, proximity of sewers, middens, piggeries, poultry and pigeon houses, dirty and badly ventilated dairies, impure water

supply, inefficient cleansing of milk vessels, exposure of milk to dust or bad smells, want of proper sieving, mixing of old and fresh milk.

Contamination in Transit.

The common sources are dirty and badly made milk churns, carriage in ill-ventilated milk vans, particularly if carried in conjunction with fish and other strong-smelling articles.

Contamination at Milkshops.

Milkshops are frequent and fertile sources of contamination. The shops are often quite unsuitable for the purpose, being in many instances general stores selling anything, from a red-herring to a box of matches. Upon the counter of such shops it is often possible to see uncovered pails of milk, catching dust, absorbing bad smells, and being used by flies as places for bathing or committing suicide.

Contamination during Delivery.

Delivery in open milk pails, pails with badly-fitted covers, exposure through having the lid lifted off every time a customer is served, diseased or dirty milk-sellers, wet weather, causing drippings from the sleeves of the milk-sellers into the milk-can, exposure of milk-measures by being carried openly in the street, deposited in a dirty cart or in the pocket of the milk-seller.

Effects of Contamination.

By the consumption of contaminated milk disease may be conveyed to the consumer, and such disease may be either milk-produced or milk-borne. A disease common in milking cows is tuberculosis, and numerous experiments have proved that so far as domesticated animals are concerned the milk from cows suffering from tubercular mastitis will cause tuberculosis when consumed by them. Whether such milk will cause tuberculosis in persons consuming it is at present a question being investigated by a Royal Commission, whose Report is not yet to hand. So far the majority of medical authorities appear to agree that tuberculosis of the intestines in human beings, and especially in young children, may sometimes be of bovine origin, caused by the consumption of milk from cows suffering from tuberculosis of the udder. Epidemic diarrhœa is another disease in human beings which there is strong reason to believe is often caused by the consumption of contaminated milk.

In his paper "Food Poisoning and Epidemic Diarrhœa," Professor Delêpine sums up the matter as follows:—

(1) "Epidemic diarrhœa of the common type occurring in this country is apparently in the great majority of instances the result of infection of food by bacilli belonging to the colon group, or bacilli which are present at times in fæcal matter.

(2) "Milk, which is the most common cause of epidemic diarrhœa in infants, is frequently infected at the farm or (through vessels) in transit."

Epidemic sore throat in human beings is another disease supposed to be caused by consumption of the milk of cows suffering from suppurative mammitis. Such an outbreak occurred at Woking in November, 1903 (see *British Medical Journal*, December 5, 1903).

Other diseases which have been stated to have been produced in human beings by consuming contaminated milk are pseudo-diphtheria, septic fever, foot and mouth disease, cowpox, anthrax, &c.

Epidemics of milk-borne diseases have been fairly common, but almost invariably the source of infection has been a human being, and in such cases the milk has simply been the conveyance by which the infection has been carried to other persons. The three diseases most commonly considered as milk-borne epidemics are scarlet fever, diphtheria and typhoid fever. In regard to the latter, there is strong reason to believe that the infection has in some cases arisen through farm water supplies being contaminated with sewage, whilst in others no doubt personal contamination of milk has been the source of the mischief.

Methods of Preventing Contamination in Milk.

The aim of all sanitary authorities, whether State or municipal, must be to see that the milk is produced from clean and healthy cows, housed in clean and sanitary cowsheds, provided with good food and pure water, attended and milked by clean and healthy attendants; that the milk is removed as quickly as possible from the cowshed or milkshed to a clean, cool and sanitary dairy for the purpose of being immediately sieved or filtered, refrigerated, and placed in milk churns or bottles, and so kept from exposure to the air and subsequent contamination.

During transit milk should only be put into properly constructed and clean churns; these during conveyance to and from the railway stations should be locked or sealed, protected from the sun and rain, and not allowed to stand in the sun and exposed to dust on hot and windy railway station platforms, but immediately placed for conveyance in clean, well ventilated, cool or refrigerated milk vans, used for no other purpose.

Delivery to customers' houses should, if possible, be by airtight, clean pint or quart bottles. If larger bottles or churns are used these should be provided with taps which in turn should be covered when not in actual use. Open milk cans and dipper measures should not be used unless some special precautions are taken to prevent exposure of both them and the milk to dust or rain. In the dairy or milkshop milk should only be kept in small quantities for immediate sale, and then only in properly covered, clean utensils, larger quantities of milk being stored in a clean, cool, and well ventilated cellar, or in a refrigerating chamber.

A few details as to the prevention of contamination at the cowshed will no doubt be interesting to a conference of veterinary surgeons and others interested in dairy sanitation. The cowshed should be kept as clean as possible and so lighted that all parts are easily visible when the doors are closed, otherwise dirt will not be seen. It should be so ventilated by means of "inlets" and "outlets" that the air will not be oppressively hot or stuffy. The windows ought to be opened in hot weather. The cubic area should not be less than 600 cubic feet per cow for small cows, up to 800 cubic feet for large cows.

The cowshed is best built open to the roof and ought not to be less than 18 feet wide, having a feeding passage in front of the cows and a milking passage behind them, each not less than three feet wide. The

floor should be made of some impervious material, preferably flagstones, well set in cement or concrete. The partition in front of the cows must be high enough to prevent the cows getting their heads over into the feeding passage. The stalls should not be longer than 7 ft. 3 in. to 7 ft. 6 in., including the feeding trough, and if double stalls, they should be about 7 ft. wide. Single stalls 3 ft. 9 in. to 4 ft. are preferable, if only to prevent cows treading upon their neighbour's teats. The feeding trough is best made of glazed earthenware and set upon the level of the floor. There should be a drop of 4 in. to 6 in. from the stall to the dung channel, the latter being 2 ft. wide with a slight fall backwards to the urine channel, which should be 1 in. lower and about a foot wide. The fall lengthways in the urine channel should be about 1 in 80, and should empty on to a trapped inlet to a drain situate outside the cowshed.

The manure should be removed from the cowshed at least four times a day, and the channels flushed with water once daily. For the latter purpose, and also for convenience in watering the cows, it is advisable that a piped supply of water be provided in each cowshed. The cows should be provided daily with good, clean bedding, they should be kept clean by regular grooming or brushing, and their udders and teats washed and dried before milking, if necessary.

The cowshed should not be used for storing food, and it should not be filled with dust by brushing the cows or the building or by fodderring, just immediately prior to or during milking. It is preferable to milk either in a clean, special milking shed, or in the open air. There is less liability to contamination by the use of milking machines or hygienic milking pails.

The milkers should be healthy persons, certainly not tuberculous, or suffering from any infectious disease; they should wear clean overalls, and have clean hands and short nails. Wash-bowls, water, soap, and towels should be provided in or near the cowshed for cleansing the milkers' hands. "Dry" milking should be enforced, and at each milking the cows' udders should be examined for diseased or abnormal conditions. The milk of cows with diseased udders should not be sent for human consumption, and cows exhibiting signs of tuberculosis of the udder should be notified to the local authority where the milk is consumed. Immediately each cow is milked, the milk should be taken direct from the cowshed to a clean and sanitary dairy to be at once sieved and cooled. It should not be left in open vessels, exposed in the cowshed, or placed so as to be accessible to dogs, cats, or flies. After cooling, the milk should be at once put into clean, covered milk utensils, preferably air-tight stoppered bottles. In cooling the milk it is essential that the temperature be lowered to at least 50° F., and in the summer it will often be necessary to use ice in order to obtain such a low temperature.

Dairy Inspection.

For nearly thirty years State and municipal sanitary authorities have been trying to solve this question of milk contamination, and only, it is to be feared, with limited success. Not but that these authorities know what ought to be done to protect milk from contamination; the question rather is how to get it done.

Since 1879, dairies, cowsheds, and milkshops orders have been

in force, and under the order of 1885 local authorities *may* make regulations for any or all of the following purposes:—

(*a*) For the inspection of cattle in dairies.

(*b*) For prescribing and regulating the lighting, ventilation, cleansing, drainage and water supply of dairies and cowsheds in the occupation of persons following the trade of cowkeepers or dairymen.

(*c*) For securing the cleanliness of milk-stores, milk-shops, and of milk-vessels used for containing milk for sale by such persons.

(*d*) For prescribing precautions to be taken by purveyors of milk and persons selling milk by retail, against infection or contamination.

It should be noticed above that local authorities *may* make regulations—it is not shall or must—and no doubt that one word accounts for much that has been left undone in rural districts, where in many cases, either no regulations at all have been made, or if made, not been enforced. On the other hand, in the majority of urban and suburban districts regulations have been made and enforced, with the consequence that milking cows are now housed under far better sanitary conditions in towns than in country districts, and as a result, which has been proved over and over again, that cleaner and better milk is produced in the former than in the latter.

The result of this want of compulsion in dairy inspection is farcical, were it not serious, for whilst cowkeepers in some districts house cows and produce milk under more or less stringent regulations with their accompanying expenses, in others, where no regulations are in force, and consequently no sanitary expenses incurred, farmers and cowkeepers keep cows and produce milk under conditions that leave much to be desired.

What appears to be wanted is to secure compulsory, reasonable, and uniform dairy inspection, and to have it carried out by practical dairy inspectors under a central authority.

In Italy such a system has existed some time, the inspection being carrried out by veterinary officers of health. The Legislative Assembly of Victoria, Australia, has lately passed an Act regulating the production and sale of milk and dairy produce, and enacting the most stringent regulations towards securing the purity and excellence of those commodities. The administration of the Act is vested in the Minister of Agriculture and the local authorities. Inspectors and supervisors for the carrying out of the law are appointed by the Government itself. The duties of these officers are specifically defined, and are of a friendly and advisory character, but they also include the strict supervision of the dairy farms. These latter and also butter factories, must be annually licensed. All cows are to be carefully supervised, and power is given to prohibit the sale or use of any cow whose produce is used for dairy purposes, the result of which may be deleterious to health or in any way unwholesome. Certain diseases of cattle are notifiable, and provision is made for the isolation of infected cattle. Various regulations deal with the employment of persons engaged in the dairying industry to ensure freedom from contagious or infectious complaints when handling cattle or their produce. Ample powers are conferred on the supervising officers to ensure complete aseptic conditions and for a supply of pure water, so necessary where butter is concerned. Many other provisions are of extreme interest, one, for instance, being that of establishing model dairies in the various municipalities. Various other regula-

tions deal with many miscellaneous matters, such as the standard or test to be applied to milk. The whole of this enactment is enforced by stringent penalties, and when it is in force Victoria can claim credit that it has, so far as human foresight can provide, a law which enables the purchaser of any dairy produce from that State to rely on having a pure, genuine, and unadulterated article.

Were some such Act of Parliament in force in this country it would no doubt be possible to obtain a supply of pure milk, but owing to the increased cost necessary for compliance with such regulations it is questionable whether milk could be supplied at present prices.

Unfortunately it is the poorer people in our large towns who now get the most impure milk, and if the price was raised they would, whilst getting a purer milk, certainly be able to get less in quantity.

Municipal Milk Depots.

It is probable that the question of supplying pure milk to the poorer classes will have to be dealt with by the establishment of municipal milk depôts. Veterinary inspectors will probably not be called upon to interest themselves much in connection with these, except so far as seeing that the milk supplied to them is produced under cleanly conditions from healthy cows, housed in sanitary cow-sheds.

The questions of sterilisation, modification, humanisation, &c., of milk have been purposely left out of this paper for two reasons; first, that they are matters more concerning the province of the medical officers of health; and secondly, that they are processes dealing with the alteration of milk for special purposes, and have little to do with the production of milk, or the prevention of contamination in collection and transit.

THE HYGIENIC CONTROL OF THE MILK SUPPLY.

Abstract of a paper read by William G. Savage. B.Sc., M.D., D.P.H., *Medical Officer of Health, Colchester.*

I think there can be no doubt that the present legal enactments are quite insufficient to preserve the purity of milk. Rural authorities are not inclined to go to the expense of seeing that all milk is produced under the best conditions, and there are no powers to compel them; cows can be diseased and still be used for milking purposes, &c. In these and many other directions alterations in the law are required, but there is considerable difficulty in saying what steps are practicable and, looked at from all points of view, beneficial to the public. No doubt medical officers of health could draw up regulations which would effectively control the milk service, and establish a pure milk supply, but we have to consider what measures are likely to be considered by Parliament, and we must avoid, if possible, any steps which would cause an increase in the retail price of milk.

Short of drastic alterations there are, however, a number of comparatively simple powers wanted which, while not burdensome or

unduly restrictive, would yet materially improve the condition of vended milk. I do not advance the following considerations as in any way a complete solution or as altogether new, a number of them have been advocated before, but, as stated above, we need a united front, and a united and therefore authoritative opinion, and to obtain it, frequent discussion among ourselves is imperative.

What seems to me to be required is a definite enactment that no persons shall be registered until and unless their premises have been licensed and certified to be suitable, and in accordance with the regulations of the local authority, and that such licenses be not granted for more than three years. Such powers should not be burdensome, and they would ensure periodical inspection. In particular they would, I believe, largely aid in the prevention of the sale of small quantities of milk from small general shops. As we all know, a large amount of milk is so sold; such shops are often dirty, dusty and ill-ventilated, and altogether unsuitable for the sale of milk. At present it is not easy to take action against them, but if every such place had to be examined, reported upon and licensed, it would be easy to oppose the granting of licenses, and most of them would be suppressed. It will be urged that this enactment will make no difference in rural districts, since licenses will be granted without adequate inquiry. That may be so to a considerable extent, but not in all, while it is chiefly in urban districts that it would be of most importance.

I hope we are all agreed that the use of any preservative whatever in milk should be prohibited. I do not propose to discuss this question, but it seems to me a most necessary factor in obtaining a pure milk supply.

The adoption of regulations under the Dairies, Cowsheds and Milkshops Orders should be made compulsory, and a certain minimum of adoptable regulations framed, including the simple cleansing precautions necessary to be taken at milking to ensure a clean milk.

In view of the fact that in quite a number of instances slight udder or teat affections have given rise to an extensive outbreak of sore throat or other disease, while we have no powers to prevent such outbreaks, it is very necessary that further powers be obtained to deal with such conditions. I think that all udder and teat diseases and all wasting diseases of any cow in milk, should be forthwith notified to the medical officer of health, and that no milk from that cow be sold, under a heavy penalty, until permission be given by the medical officer of health, or better, a properly appointed veterinary surgeon. Powers to compensate for loss should be given. The extensive outbreak of septic sore throat at Colchester, in April, 1905,* will serve as an illustration of the need for such notification of udder diseases. The outbreak was traced to a cow belonging to one of the six farms supplying the milk. The cow was in a shed with the others, two quarters were apparently healthy, one was suspicious, whilst the last quarter was markedly diseased, yielding yellow-brown pus. If the condition had been notified to me on April 19, when it was said to have been first noticed, this outbreak of at least 600 cases would have been avoided.

The most important alteration in the law, however, is, in my

* See *Public Health*, October, 1905, p. 1.

opinion, to give local authorities power to inspect cows and cowsheds outside their own districts. It is in particular in regard to the milk of large towns, much of which comes from long distances, that improvement is urgently necessary, and I see no hope of improvement unless those who consume the milk themselves exercise power over its production. Human nature being what it is, it is not to be expected that a rural authority is going to spend a considerable amount of money in inspecting cows and cowsheds in their district, where individually many of the members have a pecuniary interest in the milk trade, and when all improvements are not for the benefit of themselves, but of some perhaps far away town.

I see no fundamental objection in a local authority having power to inspect all dairies and cowsheds and cows, and to collect samples of milk, from anywhere, provided that the milk comes into the district of that local authority for purposes of sale there. If the conditions are unsatisfactory, then the local authority to have power to apply to a magistrate to prohibit the sale of that milk within their district until written permission is again given. Of course the milk producer must be given notice to be present, or his agent, and the local authority must be prepared to furnish definite conditions which on being complied with, entitle the milk producer to again send his milk into the district.

The powers of the local authority would simply be to prohibit the sale of the milk within their district. They would have no power to prosecute or to order any works to be carried out. When they have prevented the sale of the milk in their districts, their personal concern with that cowkeeper would cease.

To carry out such a regulation it is obviously essential to have an additional clause that all milk vendors must send to the local authority a list of the sources of their milk, and must keep it up to date by sending in lists of alterations.

The kind of results would be much as follows. Many of the cities and boroughs recognising the need for inspection would make use of this provision, and send inspectors to inspect the cowsheds from which milk came into their districts.

Of course the visits would be surprise ones, and no doubt the bacteriological examination of milk would play a part in enabling authorities to select milk producers for inspection.

Those with unsatisfactory premises, or which showed no evidence that they complied with the regulations in force, would be cited to appear, and the sale of their milk would be prohibited.

The milk seller would either—

(*a*) Send his milk elsewhere;

(*b*) Ask the local authority what they required him to do.

As a result the borough would frame regulations embodying their requirements, and I believe there would be a rapid conformation to them.

The inspector or medical officer of health would no doubt—

(1) Send a list—a "black list" of the suspended cowkeepers to other local authorities for their information;

(2) Would report the non-compliance of the milk producer to the local authority in whose district he is, calling their attention to the breach of their own regulations.

In addition to the above, fresh powers to enable the effective cooling of all milk which has to undergo train transit, is necessary. For all milk coming into a city or town by train, it would be a sufficient objection to allowing that milk to be admitted, that there were no proper cooling appliances on the farm.

In a number of other directions, particularly in regard to better means for preventing the sale of infected milk, more powers are required; but in this paper I have mainly had in view measures to mitigate, if not obviate, the general bacterial contamination of milk which is now so extremely common.

Translations and Extracts.

ASEPSIS AND ANTISEPSIS IN VETERINARY SURGERY.

BY M. DEYSINE, VETERINAIRE EN 1er 7 DRAGOONS.

DURING the last few years several operations have been introduced into veterinary surgery which formerly could not be attempted on account of the unsuccessful after-results.

The horse has always had the reputation of being prone to suppuration and what was known as "laudable pus," used to be the most that the operator could hope for. Healing by primary intention was almost unknown, and in the few cases in which it did occur it was attributed to the manual skill of the operator.

Now this is all changed, and, as pointed out by MM. Delcambre and Cadore ("Memoires d'hygiene et de Medicine Vétérinaires," 3rd series, vol. iii., page 262), "the supposed predisposition of the horse to suppuration is an error, and by taking a few simple precautions, in nine cases out of ten, healing by primary intention can be obtained. Of course, the practitioner of human surgery has an advantage in the better surroundings and means of special adaptation that he can apply to his patient, and is able to undertake the most formidable operations which only a short time ago would not be dreamed of. The methods of the human surgeon were at once adopted by the veterinary profession, and even in the earlier efforts the results were surprising.

There were, however, certain conditions that were antagonistic to complete success, the chief one being the straw bed on which the patient was thrown, which, under the most favourable circumstances, was a source of contamination.

Various plans to obviate this drawback have been suggested, such as covering the straw bed with tarpaulins or sheets. Special mattresses, special operating tables, and apparatus. Of these latter, Vinsot's appears to combine the advantages of less likelihood of causing accidents, of more firmly securing the animal, and greater facilities for complete asepsis.

The apparatus, however, is expensive, and the majority of veterinary surgeons are still content to use the straw bed, which may or may not be covered with a cloth or tarpaulin. These cloths are of doubtful efficiency in preventing the spread of organisms, and they

certainly have the disadvantage of retaining fluids, so that the operator is in an antiseptic bath.

This difficulty can be overcome by piercing the tarpaulin with holes, but this facilitates the passage of microbes from the straw and defeats its object.

Precautions of this nature, to prevent the contamination of the wound with dust from the operating-bed, are merely preliminaries in veterinary surgery, and the bad conditions of the stable have also to be struggled against, a matter which the human surgeon is only hampered with in a very minor degree. In animals, this source of contamination is usually counteracted by the use of voluminous bandages and dressings wherever possible, but in certain regions, where it is impossible to apply them, it is not uncommon to obtain healing by first intention, and one is drawn to conclude that the evil surroundings of the straw bed and stable are not such preponderating causes of contamination as is generally supposed.

It is out of place to discuss the different methods of obtaining asepsis; they have been fully described by many writers, Jacoulet, Vinsot, Delcambre, Jobelot, Joly, Guerroau, Simonin, Le Calvé, and others; but it appears that equally good results could be obtained by simpler and cheaper methods, and of the various antiseptics that are absolutely indispensable.

The author, like most others, has used a solution of corrosive sublimate and a dressing of iodoform, and had good results, but he is doubtful whether these were due to the particular dressing used or prior cleanliness.

A few words are necessary regarding the much disputed point of the utility of antiseptics in asepsis. Whatever the value is of an antiseptic prior to the operation, there can be no doubt that when the skin is shaved, washed, and freed from grease and impurities, that it must have an irritating effect, and being trickled over the part in a stream, they are not in contact sufficiently long to destroy the deeper-seated organisms. Recent observations appear to show that it is impossible to disinfect instruments and dressings by even prolonged contact with the usual disinfectants used, and that their application to the part to be operated upon, which is usually done after scrubbing with soap, is of such short duration as to be useless.

After the preliminary toilet of the part, the surgeon proceeds to operate on a field that is more or less aseptic, and if the instruments and his hands are in the same condition, he proceeds with confidence. If the operation is a long one, the prolonged application of antiseptics must have a bad effect.

Gottschalk (*Pressé Medicale*, September 21, 1901) has made a valuable study of the treatment of wounds. He has shown that notwithstanding the nature of the wound, whether operative or accidental, the bleeding is always followed with an exudation of serum, and that the leucocytes in the part protect it from microbean invasion.

The same has been noted by Buchner, Nuttal, Ogata and Schloffer, who have shown that a soluble material allied to diastase exists normally in the blood, and passes to the secretions from the wound. They also note that microbes develop but very slowly in a wound during the first few hours, and indeed they sometimes actually decrease in number. They proved this fact by cultivations of staphy-

lococci on media containing the secretion from wounds, and found that the microbes at first decreased in numbers, but multiplied after about the tenth hour.

The result of these observations would appear to be that in the scientific treatment of wounds this defensive action of nature should be followed and even exceeded, but that this cannot be done with powerful antiseptics, regarding which Duclaux, in the *Revue de Paris* for 1897, in an article "La defence contre la Maladie," makes the following observation: "Leucocytes are our friends, and we should encourage them."

It therefore appears that antiseptics should be discontinued as such, and a substance that is friendly to leucocytes employed. On this point Pirobrajensky has made some experiments in the application of a fluid as nearly resembling serum as possible to wounds, and he finds that boiled salt and water solution at a temperature of 40° C. most nearly realises these conditions; salt solution being a good culture medium for leucocytes. The argument, therefore, is that if antiseptics are not only not necessary but actually harmful, why not dispense with them, and in human surgery many distinguished operators have done so, using nothing but boiled water, and protecting the wound with a simple dry antiseptic dressing. Iodoform was condemned by Nocard; it has a most disagreeable smell, is not an antiseptic, and is fast going out of use in the case of human beings.

Such are the reasons advanced against the use of antiseptics, and it remains to be shown that good results can be obtained without them.

Asepsis.—The number of operations which can be performed on the horse are limited, and the only ones necessary to mention are neurotomy, synovidectomy, castration, accidental wounds, and autoplastic operations; the other ones will not heal by first intention, and trephining, operations for gathered nails or side bones come into another class, but nevertheless the same antiseptic precautions are indicated.

For the past three years the author has abandoned the use of antiseptics entirely. The following is his procedure in median neurectomy, synovidectomy, or an autoplastic operation on the knee or back:—

Preparation of Instruments.—An hour beforehand they are taken from their cases and carefully cleaned with cotton wool. Each instrument is dipped in spirit which is set on fire, and the process repeated three or four times, and then at once thrown into a china dish containing boiled water, the dish having been rinsed out with the same; by this plan the temper of the steel is not injured. Scissors and forceps which retain a certain quantity of dust in the joints should be boiled for a few minutes before being dipped in the spirit and set on fire.

Dressings.—These are placed in an enamelled iron dish that has been previously burned with spirit or washed with boiled water, and which contains freshly boiled water; tow pledgets should be squeezed out as much as possible. It need hardly be mentioned that all these manipulations should be done either by the operator himself or his assistants, whose hands are absolutely clean. The dressings should be taken out of the box in which they are usually kept, and placed on a clean paper till required.

Field of Operation.—The part is clipped, shaved, washed with soap, washed with *hot* boiled water, and dried with cotton wool.

Operator and Assistants.—The hands should be washed with hot soap and water. The author condemns the use of a nail brush unless it is sterilised each time it is used, and even then he looks upon it as dangerous. The hands are again washed with soap and rinsed under a hot-water tap; this removes any impurity left by the soap. The hands are better not dried, as the towel may contaminate them unless it is absolutely certain it is sterilised. The author repeats that in veterinary surgery in reality all operations are reduced to simply suturing the skin, and all that is necessary is cleanliness; elaborate precautions are not required. Even in operations for hernia, appendicitis, and laparotomy in the human being no more is required, and only the instruments and dressings need be sterilised.

Operation.—An assistant takes the dish containing the pledgets and swabs the wound as required, and a second one keeps it irrigated, especially at the edges, where blood is likely to collect. It is essential to operate quickly. Before the sutures are passed the wound is well flushed with boiled water at a temperature of 40° C. The author uses silk sutures. He lays great stress on leaving as little of the surface of the wound as possible exposed to the air, and passes the middle suture first, leaving the most dependent part till last, to allow of the escape of blood. As soon as the sutures are tied he washes the part again with hot boiled water and applies a suitable bandage.

Auto-plastic Operation for Broken Knee.—The patient is thrown in the usual manner and then put on his back and fixed by two side lines, one passed through a ring in the wall and the other to a firm post in the ground opposite to it. These lines must be very tight, so as to keep the horse steady; it is also advisable to place a bag of hay or chaff each side of him.

The limb to be operated upon is taken out of the hobbles and Vinsot's splint applied, so as to keep it extended, and then the operation can be easily performed.

The dressing recommended is the ordinary starch gauze bandage, which is soaked in boiling water for about three minutes, taken out with a pair of forceps and squeezed out. One bandage is usually sufficient. It must be applied with as little delay as possible. and has the great advantage of remaining in position and keeping the wound covered, notwithstanding any movement the animal may make, and a pad of wool is not necessary. These bandages are about 15 feet long, but the author puts an ordinary linen one over all; he, however, thinks this is superfluous.

In median neurectomy he merely covers the wound with a thin layer of absorbent cotton.

In this operation a wooden splint the length of the limb is used, which keeps the limb fixed. A piece of mackintosh about a yard square is pulled under it as soon as the washing is finished.

In all these operations no antiseptics are used at all, but nevertheless primary union is obtained as a rule. M. Joyeux has performed two plastic operations on broken knees under these conditions with excellent results, and if this is not obtained the absence of antiseptics is not the cause, but lack of skill on the part of the operator.

Accidental Wounds.—In injuries of this nature the author uses the same procedure. As it is usually impracticable to shave the part, and valuable time would be lost, the author contents himself with cutting

off the hair as closely and as near to the edge of the wound as possible, washing it with warm boiled water and allowing it to flow over the part while applying the sutures. If a dressing is applied, the bandage should not be pulled tight, as in such wounds there is always a certain amount of swelling, but M. Simonin's method of dressing with a thin layer of absorbent wool fixed by collodion is recommended as being preferable (*Revue Générale de Médecine Vétérinaire*, June 15, 1905, vol. v., p. 657).

The author claims to have shown :—

(1) That antiseptics, instead of being necessary, are frequently absolutely objectionable.

(2) That by absolute cleanliness and the use of warm boiled water healing by first intention can be obtained in most cases.

(3) That the same method is successful in accidental wounds.

(*Revue Générale de Médecine Vétérinaire.*)

TREATMENT OF TETANUS BY INTRA-CEREBRAL AND INTRA-SPINAL INJECTION OF ANTI-TETANIC SERUM IN THE SOLIPEDES.

BY MM. SANDRAIL AND CUILLE (TOULOUSE).

Mm. Sendrail and Cuille made a communication to the Clinical Society of Toulouse as to the result of certain experiments as to intra-cerebral and intra-spinal injection of anti-tetanic serum in tetanus in the horse.

In two cases of intra-cerebral injection the cases were aggravated. A mule was affected in a subacute form ; the spasms came on at considerable intervals, and he was able to drink and take gruel and semi-liquid food. The intra-cerebral injection of serum caused rapid aggravation and the animal died on the third day after the operation.

A horse with very acute tetanus, unable to swallow, pulse and respirations very quick. Intra-cerebral inoculation made the animal very much worse and he died twelve hours later.

Intra-spinal injection, on the contrary, appeared to be beneficial. With a horse that had the disease in a severe form, an injection at the lumbo-sacral articulation relieved the symptoms. In a second case there was an improvement after each injection, so much so that the animal was able to feed to a certain extent. Unfortunately, the patient died on the sixth day after the commencement of the treatment, from gangrenous broncho-pneumonia, due to food passing into the trachea. In a third case there was rapid improvement after the injection. The results would seem to warrant further trial of the intra-spinal method, which is easily given and does not require an anæsthetic or any means of restraint.

(*Revue Vétérinaire.*)

SPRAIN OF THE PERFORATUS TENDON.

BY M. A. CHANIER.

It is well known by every one who has had anything to do with horses that the perforatus tendon is more frequently sprained than any other part of the organs of locomotion, indeed, it has been proved by statistics to be the case beyond the possibility of doubt. Many reasons

have been advanced for this peculiar liability, and I have no intention of entering into a discussion as to their correctness.

I have noticed, when riding in the rear of a troop of horses, that during the period the limb is off the ground in suspension the perforatus tendon is relaxed, and lies slack and almost in a fold over the cannon bone. This is explained by the fact that the deep flexor continues to act on the foot and pastern alone, without the assistance of the superficial one, which, when the limb is flexed off the ground, becomes too long and is thrown into folds. This slackening and folding of the tendon can be seen in all horses, and in both fore and hind limbs, and the fold is always inclined to the outer side. This slackening or fold may be situated at the centre of the cannon bone or a little above the sesamoids; in a very few instances I have seen it above the middle, higher up towards the knee. It goes without saying that this is seen only in fine-legged animals that have been clipped.

The explanation is that the perforans is always at work, on account of its being opposed to the anterior extensor of the phalanges, whereas the perforatus is at certain times quite slack; and as every one knows, a string is more easily broken by giving it a sudden jerk than under a steady strain. This theory is supported by the fact that the tendon is almost always strained at the point where the fold takes place, *i.e.*, midway between the knee and fetlock.

(*Revue Générale de Médecine Vétérinaire.*)

PIROPLASMOSIS AS A COMPLICATION TO SOUTH AFRICAN HORSE SICKNESS.

BY DR. THEILER, SUPERINTENDENT TRANSVAAL GOVERNMENT BACTERIOLOGICAL LABORATORY, PRETORIA.

In my notes on equine piroplasmosis I have shown that this disease was communicable to susceptible animals by the blood of horses, mules, and donkeys that had previously had it, but recovered, and were refractory to it. I also pointed out that a similar condition might exist amongst horses and mules bred in a country in which the disease was prevalent, and that accidents might take place if their blood was used for the purpose of inoculation. This might arise in the course of carrying out the plan of vaccination against South African horse sickness by a simultaneous injection of serum and virulent blood.

It is possible that a horse or mule born and bred in a country in which piroplasmosis exists may resist inoculation, as such animals enjoy a high degree of immunity, and that the same might be the case with imported horses that had been any length of time in the country. The danger of virulent inoculation is *nil* if an absolutely clear serum is used, or should it contain any blood, if it has been preserved for any length of time, or the piroplasm is killed, whereas the horse-sickness virus is preserved for several years.

In spite of all precautions, the disease has been seen several times after the inoculation of horses and mules that were thought to be immunised against biliary fever (piroplasmosis), and this may be

explained by the analogy with bovine hæmoglobinuria (red water), which often is concurrent with other diseases.

It seems to me that the organism retains its vitality in animals that are refractory to the disease, or whose blood will not reproduce it in immunised ones, but that under the influence of a febrile attack, such as is seen in horse sickness, the virulency is again aroused, although in a healthy state the animal is refractory.

The following cases are illustrative :—

(1) *Piroplasmosis subsequent to inoculation for horse sickness, from the infected blood.*—An Argentine mule, aged 4 years, that had been not long in the country. The animal was inoculated for horse sickness on December 18, 1904, with blood from a case that had been attacked the same day. The horse was an old animal that was sent to the laboratory for the production of virus. There was a typical reaction in the mule. On the twelfth day the urine was red, and the case diagnosed as biliary fever, the piroplasmosis equi being present in large numbers. The mule was very ill, but recovered.

A nine-year-old horse was inoculated for horse sickness on December 18, with virus from a horse that had contracted the disease four days previously. There was a typical reaction, the symptoms being those of "dikkop," but at the same time there were those of biliary fever, with bloody urine and piroplasma in the blood twelve days after the inoculation. This animal died on the night of December 31, 1904, and on *post-mortem* examination the muscles and serous membranes were stained yellow, and the spleen enormously enlarged, weighing about 24 lbs.

Both the horse and the mule were in a condition ready to contract piroplasmosis from the blood with which they were inoculated, and both became seriously ill. I would remark that the red colour of the urine is often absent in cases of equine piroplasmosis.

(2) *Piroplasmosis in acclimatised animals.*—These observations were made on mules that had been in the Transvaal for at least three years, and could reasonably be supposed to be acclimatised, and ninety-eight were inoculated in two batches against horse sickness. The first lot were inoculated with fresh serum and virus, the second with fresh serum and preserved virus. It is well known that fresh serum always contains a certain proportion of red blood corpuscles. And these experiments at least show that with mules that are acclimatised in the Transvaal a certain number become infected with piroplasmosis when fresh blood or serum is used to inoculate them for horse sickness. In this instance there were nine cases of piroplasmosis and three deaths. In severe cases there was red urine ; the organism also was detected in the blood, and there was also a higher degree of fever, which continued longer than is usually seen in vaccination against horse sickness.

(3) *Piroplasmosis in animals that are immune to the disease.*—A horse contracted biliary fever in July, 1904, and recovered on October 13 of the same year. He received 2·500 cc. of blood in which there were numerous piroplasma. There was no reaction, and evidently the animal had a high degree of immunity.

In December, 1904, the same horse was inoculated for horse sickness, giving a typical reaction of "dikkop." The symptoms of "dikkop" did not disappear, and a second manifestation lasted for ten

days, during which all the appearances of biliary fever were present with piroplasma in the blood; the temperature then began to fall in an irregular manner but never came down to normal, and the horse died on January 26, 1905.

The *post-mortem* examination was made an hour after death. The body was greatly emaciated, the muscles being of a brown and the organs a yellow colour; the heart was enlarged and contained a blood clot; the lungs were slightly œdematous; the liver enlarged, hard and yellow; spleen somewhat enlarged and very hard, on section showing yellow pigmentary patches; the kidneys were pale. This case appears to be one of chronic piroplasmosis with induration of the liver and spleen, the two principal centres in which the red blood corpuscles are destroyed.

This case shows that even a high degree of immunity to biliary fever will not withstand horse sickness, also the important part piroplasmosis plays in inoculation against it. These accidents are the same as those that may take place in inoculating cattle against the rinderpest by the simultaneous method.

Active immunity is necessary for protection against horse sickness; serum only is not sufficient protection during the sickly season. Complications must be expected, and a certain percentage of deaths, not from horse sickness, but piroplasmosis. Animals that have been made immune by vaccination are more susceptible than those that are born in the country or who have been in it any length of time. It would therefore seem that imported animals should first be inoculated for horse sickness and then for piroplasmosis.

(*Revue Générale de Médecine Vétérinaire.*)

CASE OF CERVICO BRACHIAL NEURALGIA IN THE HORSE.

BY M. DROUET, VETERINAIRE ER 1ET 5ME CHASSEURS.

MM. CADIOT AND ALMY in their "Traite de Therapeutique Chirurgicale des Animaux Domestiques," vol. i., page 424, say: "Neuralgia is due to a variety of causes, some well-known, with manifest symptoms at the painful part, others unknown; they can be distinguished as neurotic and nervous neuralgia.

"In animals the pain is greater or less and is due to certain lesions of the nerve trunks, and are fairly common. These, from analogy with what is seen in the human being, may be classified as neurotic neuralgia. Cervico brachial neuralgia gives rise to continued or intermittent lameness, with painful spots over the course of the nerves."

Lafosse, Renner, Kreutzer and others discuss the subject, and Zundel in his dictionary, gives a description of the symptoms of neuralgia. According to this author cervico-brachial neuralgia causes lameness, sometimes intermittent, sometimes continued, but without any great structural changes.

Leclainche, in an article on nerves in Bouley's "Dictionary," after enumerating the chief symptoms described by Lafosse and Zundel, says: "All the symptoms are most obscure, and the existence of

neuralgia in animals has yet to be demonstrated. The presence of painful spots (Valleix's points), spoken of by Lafosse, is exceedingly doubtful, and most of the other symptoms described could be attributed to other causes. Indeed, it is only with great reserve and by the elimination of other causes that it is justifiable to conclude that a pain is of a rheumatismal origin, and further than that it seems impossible to carry a differential diagnosis in animals."

The author relates a case of a mare that had been under his observation for over a year and that had been lame off and on at different times, and where history was known. He claims to have at one time discovered a painful spot on the inside of the shoulder.

The subject was a thoroughbred mare, born in 1901. As a two-year-old she had been trained between the months of July and October, when she suddenly fell lame on the near fore without any reason. The limb was carefully examined but nothing abnormal could be found, and the cause of the lameness was undetermined. A seton was passed in the left shoulder in January, and she was given a long rest. She came up sound and was again put into training. She ran at Vienna but came off the course dead lame on the near fore, but, as before, there was nothing to see to account for it.

About the direct antecedents of her sire Trident and dam Bienfaitrice nothing is known, but her own brother suffered from a similar lameness. He was supposed to have a "blood disease," and was treated by almost completely withholding all hay and giving milk and bicarbonate of soda. He ran on the flat at Mont de Marran in March, 1904, winning 3,000 francs. The mare arrived at Neufchateau in November, 1904, and was given light work. She suddenly, apparently without reason, fell lame, and the author was summoned.

When he saw her she was very lame on the near fore at a trot, but not at a walk; and she stood and put her weight on the lame leg, in which nothing abnormal could be discovered. Warm douches and massage were prescribed, and in a few days the mare was sound. Towards the end of November she was found one morning in her box dead lame and unable to place any weight on the near fore, and when moved she went on three legs, the near fore being carried slightly in advance and stiff.

From the previous history and the absence of any traces of injury, any idea of an accident during the night was dismissed. The limb was again carefully examined, but nothing could be discovered; there was no pain or heat, and the knee and fetlocks were flexed normally. Inside the shoulder a few inches from the point was a painful spot, the least pressure on which caused intense pain, although there was none in the immediate neighbourhood.

Diagnosis.—On account of the localisation of the painful spot, which was just over the cubital nerve, cervico-brachial neuralgia was diagnosed. The history of the case, the absence of all injury or lesion that could be looked upon as the cause of lameness, and the existence of a painful spot over the course of the nerve were all in favour of this diagnosis. No doubt the injection of a local anæsthetic over the course of the nerve would have confirmed the opinion, but this was not done till some time after, and the animal had been under treatment, when it was not of much value or evidence.

The theory of rheumatism was rejected. In an interesting paper on the subject, M. Chenot points out that in lameness from chronic rheumatism in the horse the painful spot is usually in the shoulder at the external face of the olecranon. In the case in question there was an entire absence of pain in this part of the limb. Furthermore, it disappeared in three or four days without local treatment, whereas in rheumatism it lasts a long time—as much as three or four weeks. The length of the intervals between the attacks, the varying degree of lameness, and the rapidity with which the mare again got sound, all point to the existence of neuralgia.

As the pain and lameness so quickly disappeared, local treatment was not adopted. For twenty days 5 grammes each of oxide of potassium and salicylate of soda were given, and then discontinued for ten days. This line of treatment was continued for six months. On December 15, 1904, the mare was again slightly lame. She was rested, the treatment continued, and in a few days she was again going sound. About March 1, 1905, she was again put into training, and ran several times during the summer.

(*Revue Générale de Médécine Vétérinaire.*)

CONGENITAL ARTHRITIS IN THE STIFLE-JOINT IN FOALS.

BY MULLIE.

THE foal is attacked, as a rule, at any time up to a month after birth, the lesion consisting of chronic arthritis, with a more or less abundant secretion of synovia; the joint being smaller, soft, fluctuating, and generally painless. As the swelling increases the limb becomes stiff, the animal stands on its toe, the lameness increases, and when moved the peculiar noise made by displacement of the patella is heard.

The cause is doubtful, and has been attributed to heredity and defective feeding of the mare, &c. M. Mullie, in three cases, has seen pervious urachus, and in four others suppuration of the umbilical cord; but, on the contrary, he has seen others affected in the same manner in which the stifles were healthy.

He advises thorough disinfection of the stable and proper sanitation, with antiseptic ligature of the cord and antiseptic dressing. A cure is difficult, so much so that certain authorities recommend slaughter.

After trying a number of different lines of treatment without success, the author is in favour of intra-articular injection of tincture of iodine, as recommended by MM. Leblanc and Thierry. The injection is made with antiseptic precautions, the quantity and strength varying according to the nature of the case. The results have been favourable; not only is there no damage, if proper antiseptic precautions are observed, but the operation can be performed on young foals before any destruction of the articular cartilage has taken place.

(*Annales de Médécine Vétérinaire.*)

Personal.

OLD students and members of the profession will read with regret of the serious illness of Professor Axe, and will join with us in wishing him a speedy and permanent recovery.

MR. WILLIAM HUNTING, F.R.C.V.S., has been appointed Examiner in Veterinary Science to the Royal Agricultural College at Cirencester in the place of the late Sir George Brown.

MR. H. E. SIMPSON, F.R.C.V.S., of Windsor, has been appointed Bacteriologist to the East African Government, and will have his laboratory at Nairobi. Mr. Simpson will take up his new duties at once.

MR. F. R. BRANDT, M.R.C.V.S., one of the Veterinary Officials of the East African Government, is now in England on holiday and health leave, after a severe attack of malarial fever.

THE appointment of Miss Aleen Cust as Inspector under the Department of Agriculture of Ireland, to carry out the orders of the Contagious Diseases of Animals Act in the Mount Bellew district of the county of Galway, has now been confirmed by the Authorities.

THE War Memorial, near Chelsea Bridge, recently unveiled by Lord Roberts, erected in honour of the officers and men of the 6th Dragoon Guards who fell in the late South African campaign, was designed by Captain Adrian Jones, M.R.C.V.S., late of the Army Veterinary Department. It is a magnificent piece of work, beautiful in design and in execution.

MR. R. H. LAMBERT, M.R.C.V.S., the well-known Irish cricketer, has again been distinguishing himself. In the match between the Phœnix and Leinster elevens, Mr. Lambert, playing for the former, scored 131 runs, and in the bowling took no less than nine of the wickets; whilst in another match (Leinster *v.* Garrison) played a few days later, he scored 218 (not out), and took six wickets. In this latter scoring he made no less than 38 boundaries. and by this display Mr. Lambert has now reached his 1,000 runs and scored his sixth century for this season.

IT was with pleasure the Board of Examiners and the Class B. students saw that Mr. Albert Wheatley, F.R.C.V.S., was again sufficiently restored to health to take his accustomed place as one of the examiners in stable management. Although hardly yet as energetic as formerly, it may be safely surmised that a few more months will see him quite convalescent.

Correspondence.

To the Editor of THE VETERINARY JOURNAL.

DEAR SIR,—In my article on "The action of Eserine in a case of Sand Colic" which appeared in the June Number, p. 297, the prescription mentioned in paragraph 3, is shown as follows: ℞ Ext. bellad. ℥j, ammon. carb. ℥ij., this should read ℥j., and ℥ij. respectively.

Faithfully yours,

G. J. WILLIAMS, *Capt. A.V.C.*

Books and Periodicals, &c., Received.

Board of Agriculture Returns; Report of the Department of Agriculture (Ireland); Veterinary News; The Elements of the Practice of Comparative Medicine (Barton and Gresswell); American Veterinary Review; Farm and Home; Recueil de Médecine Vétérinaire; Journal of the Cape Board of Agriculture; Rhodesian Agricultural Journal; Ceylon Agricultural Journal; Revue Vétérinaire; Bulletin Vétérinaire.

Letters and Communications, &c.

Prof. Wooldridge; Mr. Eve; Mr. Howard; Mr. Lloyd; Mr. F. Leigh; Prof. Craig; Colonel Nunn; Mr. Holburn; Mr. Trotter; Mr. Pauer.

NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

Letters for the JOURNAL, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements), should be addressed to the Editor.

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